OPERATION MAINTENANCE & INSPECTION REPORT

SOLUTIA INC. – JOHN F. QUEENY PLANT
ST. LOUIS, MISSOURI

PREPARED BY

Missouri Department of Natural Resources

CHRISTINE KUMP-MITCHELL, P.E.

HAZARDOUS WASTE PROGRAM

December 6, 2005

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Matt Blunt, Governor • Doyle Childers, Director

www.dnr.mo.gov

December 8, 2005

CERTIFIED MAIL – 7001 2510 0005 3345 3483
RETURN RECEIPT REQUESTED

Mr. Don Toensing, Acting Branch Chief
RCRA Corrective Action
and Permits Branch
U.S. Environmental Protection
Agency, Region VII
Mail Code ARTD/RCAP
901 North 5th Street
Kansas City, KS 66101

RE: Solutia, Inc., John F. Queeny Plant, St. Louis, Missouri, Operation & Maintenance Inspection Report (O&M)

Dear Mr. Toensing:

The O&M report for Solutia, Inc., John F. Queeny Plant, in St. Louis, Missouri, has been completed. A final copy of the report is being transmitted with this letter for your information. This report fulfills the commitment for completion and submission.

If you have any questions, please call Christine Kump-Mitchell, P.E., of my staff at the Missouri Department of Natural Resources, Hazardous Waste Program, 7545 S. Lindbergh, Suite 210 St. Louis, MO 63125-4839, or by phone at (314) 416-2960.

Sincerely,

HAZARDOUS WASTE PROGRAM

R. Bruce Stuart, P.E., R.G.
Chief, Groundwater Unit
Permits Section

RBS:ckmm

Enclosure

c: Mr. William A. Spratlin, U.S. Environmental Protection Agency, Region VII
Ms. Stephanie Doolan, U.S. Environmental Protection Agency, Region VII

OPERATION AND MAINTENANCE INSPECTION REPORT

SOLUTIA INC.
ST. LOUIS, MISSOURI

PREPARED BY

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MISSOURI DEPARTMENT OF NATURAL RESOURCES
HAZARDOUS WASTE PROGRAM

DECEMBER 6, 2005

EXECUTIVE SUMMARY

The Solutia John F. Queeny Plant is located two miles south of downtown St. Louis at 201 Russell Boulevard. The Solutia Queeny Plant began operations in 1902 as Monsanto. The plant operated from 1902 until 2005. The Queeny plant occupies approximately 63 acres of industrial land in a floodplain located on the west side of the Mississippi River.

Historically, Monsanto produced the herbicide Lasso in the former portion of the plant known as the Acetanilides Production Area. Since the plant's inception in 1902, over 200 products have been produced in over 800 different forms, including chemicals, food additives, and drugs. During the 1960s, the plant expanded to cover 72 acres and employed 1900 full time personnel. By the 1970s, production activities and the number of buildings at the site began to decrease.

In 1997, Monsanto spun-off Solutia. Pharmacia has since purchased Monsanto and spun-off the "new" Monsanto as a separate Agriculture Division.

Historically, Solutia had a RCRA Hazardous Waste Management Permit for the storage of hazardous waste in a storage pad area and for the treatment of hazardous waste in an incinerator. Both permitted, RCRA-regulated units were closed in 1994. Solutia has identified eight Solid Waste Management Units (SWMUs) and two Areas of Concern (AOCs) that might have contributed to subsurface contamination at the Queeny facility.

The primary objective of an Operation and Maintenance Inspection Report is to evaluate the methodology, procedures, analytical results, and documentation of the groundwater monitoring program implemented by Solutia at the John F. Queeny Plant in St. Louis, Missouri.

Review is accomplished through inspections of the groundwater monitoring well system and by reviewing the various documents submitted by Solutia to assess the groundwater monitoring program to:

1. Determine the physical condition of the groundwater monitoring wells;

2. Determine that the owner/operator's sampling devices are in proper working order and that sampling procedures are adequate with respect to obtaining representative groundwater samples for analysis;

3. Evaluate whether individual monitoring wells and piezometers are yielding reliable groundwater samples and groundwater elevation data; and

4. Determine whether the facility has a sufficient SAP, and whether the sampling personnel are following the SAP in practice.

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LIST OF ACRONYMS

AOC	–	Area of Concern
bgs	–	feet below ground surface
CME	–	Comprehensive Groundwater Monitoring Evaluation
cm/sec	–	centimeters per second
DNAPL	–	Dense Non-Aqueous Phase Liquid
DNR	–	Missouri Department of Natural Resources
EI	–	Environmental Indicator
EPA	–	United States Environmental Protection Agency
ESE	–	Environmental Science & Engineering, Inc.
ESP	–	Environmental Services Program
FEMA	–	Federal Emergency Management Agency
ft/day	–	meters per day
ft/ft	–	feet per foot
gpm	–	gallons per minute
GSRAD	–	Geological Services and Resource Assessment Division
GWU	–	Groundwater Unit
HSP	–	Health and Safety Plan
HWP	–	Hazardous Waste Program
LNAPL	–	Light Non-Aqueous Phase Liquid
MSD	–	Metropolitan Sewer District
msl	–	mean sea level
NOD	–	Notice of Deficiency
OBG	–	O'Brien & Gere Engineers, Inc.
O&M	–	Operation and Maintenance Inspection
OMP	–	Operation and Maintenance Plan
PAH	–	Polyaromatic Hydrocarbons
PCB	–	Polychlorinated Biphenyl
PCE	–	Tetrachloroethene
ppb	–	parts per billion
PPE	–	Personal Protective Equipment
QAPP	–	Quality Assurance Project Plan
Queeny Plant	–	John F. Queeny Plant
RCRA	–	Resource Conservation and Recovery Act
RFA	–	RCRA Facility Assessment
RFI	–	RCRA Facility Investigation
SAP	–	Sampling and Analysis Plan
SVOC	–	Semi-Volatile Organic Contaminant
SWMU	–	Solid Waste Management Unit
TCC	–	trichlorcarobanilide
TCE	–	Trichloroethene
TSD	–	Treatment, Storage, and Disposal
UST	–	Underground Storage Tank
URS	–	URS Corp.
VOC	–	Volatile Organic Contaminant

1.0 OBJECTIVE AND SCOPE

The State of Missouri's Resource Conservation and Recovery Act (RCRA) program authorization is, in part, contingent upon preparing periodic reviews of groundwater monitoring systems and programs at hazardous waste treatment, storage, and disposal facilities (TSDs).

Groundwater monitoring program evaluations are named RCRA Operation and Maintenance Inspections (O&M). O&Ms evaluate the field measurements of water quality; piezometric measurement technique; purging, measurement and sampling techniques; the facility Sampling and Analysis Plan (SAP); well and equipment maintenance; split sample comparisons; sample quality control and preservation; and Annual Groundwater Report content.

Groundwater monitoring system evaluations are named RCRA Comprehensive Groundwater Monitoring Evaluations (CME). CMEs evaluate the placement of groundwater monitoring wells in comparison to the conceptual model of flow for a site in addition to the evaluation elements for an O&M. The criteria for evaluation is whether the wells yield samples representative of conditions within the aquifer and whether they are sited to best determine contaminant transport.

The Groundwater Unit (GWU) of the Missouri Department of Natural Resources Hazardous Waste Program (HWP) is responsible for the preparation of CME and O&M reports.

The primary objective of this O&M is to evaluate the technical and regulatory adequacy of the RCRA groundwater monitoring program implemented by Solutia Inc. (Solutia) at the John F. Queeny Plant (Queeny Plant) in St. Louis, Missouri.

Review is accomplished through inspections of the groundwater monitoring well system and by reviewing the various documents submitted by Solutia to assess the groundwater monitoring program to:

1. Determine the physical condition of the groundwater monitoring wells;

2. Determine that the owner/operator's sampling devices are in proper working order and that sampling procedures are adequate with respect to obtaining representative groundwater samples for analysis;

3. Evaluate whether individual monitoring wells and piezometers are yielding reliable groundwater samples and groundwater elevation data; and

4. Determine whether the facility has a sufficient SAP, and whether the sampling personnel are following the SAP in practice.

5. Whether the facility has a sufficient SAP, and whether the sampling personnel are following the SAP in practice.

Physical examination of the groundwater monitoring system and observations of the sampling routines at Solutia were completed by the Missouri Department of Natural Resources (DNR) on March 2 and 3, 2005. Mr. Kurt Hollman of DNR's Geological Services and Resource Assessment Division (GSRAD) and Mr. Eric Sappington and Mr. Scott Robinett of DNR's Environmental Services Program (ESP) took part in the inspection that coincided with a regularly scheduled sampling event. Mr. Jeff Adams, Mr. Justin Prien, and Mr. Mike Corbett from URS Corp., (URS) were present to collect samples for Solutia.

The primary information sources used as the basis for evaluation of the Solutia groundwater monitoring program include:

- Missouri Department of Natural Resources – Hazardous Waste Program, RCRA Files for Solutia, 2001-Present
- *Measurement, Purging, and Well Integrity Worksheet*, Missouri Department of Natural Resources - Geological Survey and Resource Assessment Division, 2005
- *Sampling and Analysis Procedures Worksheet,* Missouri Department of Natural Resources - Environmental Services Program, 2005
- CA750 Migration of Contaminated Groundwater Under Control, John F. Queeny Plant, St. Louis, Missouri

Additional O&M information sources such as local/regional geologic and hydrogeologic studies, RCRA inspection reports, closure and post-closure plans and United States Environmental Protection Agency (EPA) guidance are detailed in the reference section.

2.0 SITE BACKGROUND

2.1 FACILITY LOCATION

The Solutia Queeny Plant is located two miles south of downtown St. Louis at 201 Russell Boulevard. The plant is located on the west bank of the Mississippi River at River Mile 178 (URS, 2002). The legal description of the facility is the N ½ , NE ¼, SE ¼, Section 26, T.45N., R.7E. and S ½, SE ¼, NE ¼, Section 26, T.45N., R.7E in western Cahokia Quadrangle in St. Louis, Missouri. The Queeny Plant occupies roughly 63 acres; of this, approximately 58 acre are contiguous and were used for manufacturing. The remaining 4.6 acres, located south of the main property, comprise the former Bulk Chemical Storage Area and the former Coal Storage Yard. The entire complex is covered either by concrete, asphalt, or crushed stone. An eight-foot tall fence surrounds all Solutia properties with only locked or guarded gates for access. Location and site maps are located in ***Appendix A*** of this report.

An United States Army Corps of Engineers flood wall is located east of the property and protects the facility from floodwater. According to the Federal Emergency Management Agency (FEMA) the facility is not located within the 100-year flood plain (URS, 2002). A Union Pacific Railroad switchyard is also located east of the facility. Numerous commercial and industrial businesses border the Solutia property. A map showing surrounding property as of the 2002 RCRA Facility Investigation (RFI) Data Gap Report is included in ***Appendix A*** of this report.

2.2 FACILITY OPERATIONS

The Queeny Plant was founded in 1901 under the name Monsanto Chemical Works. In 1933 Monsanto Chemical Works changed its name to Monsanto Chemical Company. The company underwent another re-naming in 1964 and became the Monsanto Company. Solutia Inc., was formed from a spin-off of the chemicals business of the Monsanto Company on September 1, 1997. Pharmacia has since purchased Monsanto and spun-off the "new" Monsanto as a separate Agriculture Division. For the purposes of this O&M Report, references to Solutia are considered to include Monsanto's ownership of the Queeny Plant. Manufacturing operations at the Queeny Plant shut down in the spring of 2005.

The facility was established on six acres at its current location in 1901 with the chemical manufacturing of saccharin. Since its inception, the Queeny Plant has manufactured over 200 products using over 800 raw materials. The major products have included but are not limited to: process chemicals such as maleic anhydride, fumaric acid, toluene sulfonic acid, and paranitrophenetole; plasticizers such as phthlate esters and toluene sulfonamides; synthetic functional fluids such as Pydrauls™, Skydrols™, and coolanols, food and fine chemicals such as salicylic acid, aspirin, methyl salicylate, benzoic acid, and ethavan; and agricultural chemicals such as Lasso™ (i.e., acetanilides or alachlor).

The Queeny Plant has evolved with time. During the 1960's the facility went through several expansions. The acreage of the facility at its peak was approximately 76 acres with over 1,900 employees. By the 1970's, production activities and the number of buildings at the site began to decrease due to a series of sales and consolidations. In 1989, the analgesics business and a nine acre parcel of land was sold to Rhone Polenc (now Rhodia), which still operates on the site. In December of 1990, production of Lasso™ was halted. In early 1991 trichlorocarbanilide (TCC) production ceased. In 1993, the maleic anhydride business was sold to Huntsman Specialty Chemicals. In 1995, the manufacture of paranitrophenol ended.

Prior to the recent shutdown and dismantling of the facility (spring 2005) the Queeny Plant produced four major products and had 95 employees. The facility batch chemical processes to produce, blend, package, and repack organic chemical products. Products included: L-aspartic acid, a nonessential amino acid used in artificial sweeteners, was produced in the YY Building; Skydrol™ fire resistant hydraulic fluids used in the airline industry were blended and repackaged in the VV Building; maleic anhydride briquettes produced by Huntsman Corporation; and Duralink™, a high temperature stabilizer used in the manufacture of rubber tires by the Flexsys joint venture in the PA building (URS, 2002).

As part of its ongoing efforts to control and remediate hazardous substances from the facility, Solutia has removed all underground storage tanks from service. Solutia has also removed all PCB sources, implemented a groundwater protection plan, and dismantled all idle facilities. All remaining manufacturing areas and plant streets drain into the facility's wastewater treatment plant. The treatment plant provides elementary neutralization and spill control prior to a permitted discharge to the Metropolitan St. Louis Sewer District System. The Queeny Plant has controlled access including a fully fenced site perimeter with locked gates, attended guard positions, and access logs.

2.3 SUMMARY OF REGULATORY HISTORY AND SITE INVESTIGATIONS

This section presents a brief summary of pertinent environmental studies and investigations that have taken place at the Queeny Plant. Investigations that have taken place at the facility fall into two categories; internal investigations performed by Monsanto or Solutia (both referred to as Solutia), and investigations required under RCRA Corrective Action. Solutia has performed several site-wide and SWMU specific investigations (e.g., hydrogeologic investigations) starting in 1983 and continuing into the late 1980's. During the late 1980's RCRA Corrective Action activities began at the facility with the RCRA Facility Assessment (RFA). The following is an overview of facility-driven and RCRA regulatory compliance investigations for the Queeny Plant.

Environmental Science & Engineering (ESE) conducted a Preliminary Hydrogeologic Study for Solutia in 1983. This was the first hydrogeological investigation completed at the facility. Sixteen groundwater monitoring wells were installed at the facility during this investigation. Site geology was logged from the deeper boring from each well

cluster by split-spoon sampling. Slug tests were conducted to determine the hydraulic conductivity of the soil formation surrounding the screened section of the well. Twelve additional monitoring wells were installed in March 1985 by ESE during Phase II of the Preliminary Hydrogeologic Study.

In March 1985, Solutia contracted ESE to investigate a leaking underground storage tank (UST) containing tetrachloroethene (PCE) located immediately west of the FF Building. During this study, soil samples were collected from eight soil borings to determine the impact to the unsaturated zone. Four recovery wells were installed in January 1987 to recover free phase PCE associated with the leaking UST. PCE was recovered during the early stages of the effort; however recovery efforts were discontinued after a few months when no additional PCE was recovered (URS, 2002).

Solutia contracted Geraghty & Miller to install five additional monitoring wells in 1986. Wells were place in the vicinity of the Lasso™ production area to determine the depth and areal extent of the free phase Alachlor and the groundwater flow direction in the vicinity. Further investigation was conducted by Geraghty & Miller to assess groundwater quality and the hydrogeologic conditions at the former Coal Storage Yard and the former Bulk Chemical Storage Area. A total of twelve soil borings and five monitoring wells were installed in these areas.

DNR issued a Facility Hazardous Waste Management Permit in 1989 for the operation of two regulated hazardous waste units: the hazardous waste incinerator and hazardous waste storage area. Solutia closed the incinerator in 1991 shortly after the permit was issued. Both areas received closure certification by DNR in 1994.

On behalf of EPA, Jacobs Engineering completed a RCRA Facility Assessment at the Queeny plant in January 1989. The report summarized the Preliminary Review phase and the Visual Site Inspection phase of the RFA. The report gathered and discussed information on releases at RCRA regulated facilities, and evaluated releases of hazardous waste or hazardous waste constituents to soil and groundwater from SWMUs. The report concluded that the SWMUs and site-wide groundwater needed additional characterization and requested Solutia to conduct a RCRA Facility Investigation.

Solutia contracted Geraghty & Miller to conduct the RFI, in March 1992, in accordance with the RCRA facility permit. The purpose of conducting the RFI was to characterize the nature, extent, and rate of migration of possible releases of chemicals to both soil and groundwater. The field investigation was conducted to supplement the existing data. Investigation activities included soil and groundwater sampling, bedrock coring, aquifer testing, risk assessment, and groundwater modeling. The four Solid Waste Management Units (SWMUs) evaluated during this investigation were the former Acetanilides Production Area, the former Quarry Area, the former Bulk Chemical Storage Area, and the former Boiler Slag Accumulation Area.

Geraghty & Miller, Inc. completed Phase II of the RFI at the Queeny Plant in the fall of 1993 and spring of 1994. Phase II was conducted in accordance with the RCRA facility permit. The purpose of conducting the Phase II was to supplement the Phase I investigation and to further characterize the nature, extent, and rate of migration of possible releases of chemicals to both soil and groundwater.

At the request of Solutia, and in response to EPA Notice of Deficiency (NOD) dated July 17, 1997, URS Corporation completed the Data Gap investigation at the Queeny Plant. The Data Gap investigation was conducted in accordance with the Data Gap Work Plan (September 24, 1999), and approved amendments. The purpose of conducting Data Gap investigation was to address the NOD, specifically to collect more data to adequately characterize the nature and extent of on-site and off-site soil and groundwater impact at or from the facility; or provide adequate information to support further corrective action decisions at the facility. The field investigation was conducted during the summer of 2000. Investigation activities included a focused soil sampling program, monitoring well installation, groundwater gauging and sampling, light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) investigation, and a monitoring well integrity assessment and upgrade.

2.4 DESCRIPTION OF WASTE MANAGEMENT UNITS

Solutia has identified eight SWMUs and two Areas of Concern (AOCs) in addition to the two RCRA-regulated units at the Queeny Plant. This section gives a brief discussion of the historical uses and investigation activities at each of these areas. ***Table 1*** provides a summary for each area, a map showing the location of each SWMU and AOC is included in ***Appendix A***.

2.4.1 RCRA REGULATED UNIT – HAZARDOUS WASTE INCINERATOR

The entire Hazardous Waste Incinerator operation was referred to as the CAC Incinerator system that included a CAC residue tank consisting of a 12,500-gallon glass-lined steel tank, a residue feed pump, and associated piping loop. The incinerator consisted of a burner plenum, thermal oxidizer, quench pot, and packed bed scrubber system. Each component of the CAC system was demolished in 1991, containerized, then shipped off-site to a landfill in Louisiana. Soil sampling in the vicinity of the dismantled CAC system did not reveal the presence of any chlorinated/halogenated compounds. The CAC incinerator was located in an area near the Lasso production area. The incinerator was certified closed by DNR in 1994.

2.4.2 RCRA REGULATED UNIT – HAZARDOUS WASTE STORAGE AREA

The Hazardous Waste Storage Area consisted of a concrete pad with dimensions of 30 feet by 50 feet and was located at the north end of the facility. The ends of the pad were sloped towards the center with a catch basin and drain and the sides were curbed. The drain was equipped with a shut-off valve. The complex was roofed and walled with corrugated fiberglass panels. The pad was used to store a variety of drummed hazardous

waste including organic solvents, semi-volatiles, heavy metals, acids and bases. A complete list of wastes stored at the pad is contained in the 1994 Closure Report. During closure in 1994, the concrete pad was observed by personnel to be stained but largely intact with no visible cracks. The pad was rinsed twice and the rinseate containerized and sampled. Sample results indicated low levels of phthalates, mercury, and phenol. Solutia performed a risk assessment using the contaminant levels identified in the rinseate and the risk levels did not appear to pose an unacceptable risk to human health and the environment. The Hazardous Waste Storage Area was certified closed by DNR in 1994.

2.4.3 SWMU – BUILDING WW

Building WW is a research and development pilot plant (leased to Monsanto [now a subsidiary of Pharmacia]) built at the end of World War II (1945-1946). It occupies an area of approximately 75 feet by 105 feet. The SWMU associated with WW Building is at the northeast corner of the structure where an electrical transformer was located. The transformer, which had Aroclor, a Polychlorinated Biphenol (PCB) containing fluid, as a heat transfer medium, was removed from service in the late 1970's. PCBs were reportedly detected in the area during the excavation to construct a concrete pit in the location of the former electrical transformer. The ground covering in this area is asphalt and concrete.

PCBs were detected in shallow soils in the WW Building area. Only one soil sample exceeded the screening criteria (sample depth 2 ft). Groundwater in the fill and silty clay and sand units is impacted by PCE/related analytes and chlorobenzene. The results of the evaluation of human health risks for soil and groundwater in the WW Building area are orders of magnitude below levels of concern for all scenarios evaluated.

2.4.4 SWMU – FORMER BOILER SLAG ACCUMULATION AREA

The former Boiler Slag Accumulation Area was a small area, approximately 25 feet by 25 feet, located on the northwest corner of the former Building JJJ boiler house. The coal fired boiler house operated from the early 1900's through 1992, when it was dismantled. This area was used as a cooling spot for the clinkers from the bottom of the boiler. The clinkers were placed on this paved spot on the ground by a front end loader, allowed to cool, then picked up by front end loader and deposited in a dumpster for future off-site disposal. The ground covering in this area is asphalt, concrete, and gravel.

Key analytes identified through previous investigations include PCBs. The source of PCBs is reportedly a former transformer substation located nearby. The most significant concentrations of PCBs occur in the area of two borings, extending to a depth of approximately 6 ft. Groundwater is relatively unimpacted in this area. The results of the evaluation of human health risks for soil and groundwater in this area are below levels of concern for all scenarios evaluated.

2.4.5 SWMU – BUILDING FF

The FF Building was a production unit for the manufacture of trichlorocarbanilide (TCC), a bacterierstat used in body soap. Production of TCC began at the Queeny Plant in 1951, and in early 1991 operations ceased and the facility was dismantled. The FF building occupied an area of approximately 150 feet by 75 feet. One of the raw materials used to manufacture TCC was PCE, which had been stored in an UST. The tank reportedly leaked large amounts of solvents into the soil and groundwater in the area. The area associated with the FF Building that constituted the SWMU involved the areas around this former leaking UST. The ground covering in this area is asphalt, and crushed and compacted stone. This area is currently not used and no buildings are located in the area.

In May 1993, O'Brien & Gere Engineers, Inc. (OBG) conducted an investigation of the soil and groundwater in the vicinity of the former FF Building, which was dismantled in 1992. The investigation consisted of soil samples, groundwater sampling from direct push borings and five existing monitoring wells, and a cone penetrometer test to assess the depth to bedrock in the area. Nine additional groundwater samples were collected from direct push borings and analyzed for TCE and PCE during phase II of the Building FF investigation in November 1993. An LNAPL investigation was also conducted to assess the limits of the free phase LNAPL in the vicinity of the FF Building Area.

The primary analytes of interest in soils in this area are PCE and TCE. These analytes are most prominent in a relatively limited area near the former UST, and extending to a depth of approximately 10 ft. Groundwater in this area (fill and silty clay, sand and bedrock) is primarily affected by PCE and its associated degradation suite, chlorobenzene, benzene, and toluene. LNAPL is present in a localized area of approximately 30 ft by 60 ft in the fill and silty clay unit.

Under current conditions, constituents in soil and constituents dissolved in groundwater do not pose an unacceptable risk or hazard. However, the presence of PCE in soil and vinyl chloride in groundwater poses a potential risk under a hypothetical future indoor worker scenario. The presence of LNAPL, while limited in extent, may add to the potential risk calculated for the future indoor worker and future construction/utility worker scenarios.

2.4.6 SWMU – BUILDING VV

Building VV is an existing structure that served as a production area known as "Central Drumming." The area encompasses approximately 150 feet by 225 feet. Activities at this location involved the unloading and bulk storage of a wide variety of liquid materials and the repackaging of these materials or a blend of these materials into smaller quantities (i.e., quarts, gallons, 5-gallon, and 55-gallon containers). The identified SWMU area associated with VV Building involved a rail car unloading area where Aroclors were unloaded and pumped into storage prior to repackaging for shipment. This area is a paved alley located between two production areas.

The primary constituents of concern in this area are PCBs in soil. The most significant concentrations of PCBs occur in two borings extending to a depth of approximately 3 ft. Groundwater in the area primarily contains PCE and related analytes and chlorobenzene. Under current conditions, constituents in soil and groundwater do not pose and unacceptable risk or hazard. However, the presence of PCBs in soil poses a potential hazard under a hypothetical future construction/utility worker scenario, should the current asphalt/concrete cap over the area be removed.

2.4.7 SWMU – Former Acetanilides Production Area (Lasso™)

The former Acetanilides (or alachlor, also referred to as Lasso™) Production Area is located in the south-central portion of the Queeny Plant. The approximate size of the manufacturing area is 300 feet by 450 feet. This production area began operations in 1966, as a multi-product facility. After Lasso™ operations ceased in 1991, Solutia kept the building and other facilities in this area intact. The ground covering in this area consists of buildings, asphalt, concrete foundations of former aboveground storage tanks, and railroad ballast near the railroad tracks.

Alachlor and chlorobenzene are the primary analytes in soil and groundwater in this area. The maximum detected concentrations of these analytes occurred in a few borings in the eastern portion of the area, and in the upper 4 ft. The depth to groundwater is shallowest in this area because of the bedrock high. Alachlor and chlorobenzene were detected most frequently in groundwater in the fill and silty clay unit, and in one well alachlor was detected at concentrations near its solubility limit. The sand unit is thin or absent because of the bedrock high. The results of the evaluation of human health risks for soil and groundwater in this area are below levels of concern for all scenarios evaluated.

2.4.8 SWMU – Former Quarry Area

A former Rock Quarry Area is located on land purchased by Solutia from American Car and Foundry in 1953. Limestone was quarried via surface mining beginning prior to 1875. The area was backfilled with soil, concrete foundations and other miscellaneous rubble. The quarry was completely filled in by 1971. The size of the quarry is estimated to be approximately 450 feet by 450 feet with estimated depth in excess of 100 ft. The ground covering in this area is crushed and compacted stone and vegetation. A locked security fence encloses the area. Sources of subsurface impact in this area may be from debris in the fill and the coal deposited in the quarry.

The most significant detections in soil consist of polyaromatic hydrocarbons (PAHs), which were detected in borings primarily in the northern portion of the area. The concentrations were relatively low (i.e., low ppm range) and were detected in samples to a depth of 11 feet below ground surface (bgs). Groundwater in the area primarily contains chlorobenzene. The results of the evaluation of human health risks for soil and groundwater in this area are orders of magnitude below levels of concern for all scenarios evaluated.

2.4.9 SWMU – FORMER COAL STORAGE YARD

The former Coal Storage Yard is an area of approximately 2.7 acres of unimproved property purchased in 1982 from Hagar Hinge. The property was used solely for the temporary storage of coal, in anticipation of a coal miner's strike. The coal was used for boiler fuel at the Queeny Plant. The property was used for a "one time" occurrence of coal storage and was later sold to Schaffer Manufacturing in 1994. The ground covering in this area is crushed and compacted stone and coal fines. This property is currently used to temporarily store tractor-trailer parts; no buildings are located on the SWMU. The SWMU is located outside of the Queeny Plant main property and site security fence, but it is fenced along the eastern boundary and is partially fenced to the north, south, and west.

Volatile organic compounds (VOCs) are the primary constituents in the soil and groundwater in this area. PCE was detected in one of five soil borings in the area. The concentration was relatively low (i.e., 0.26 mg/kg) and occurred at a depth of 2 ft. Groundwater in this area primarily contains PCE/related analytes. The results of the evaluation of human health risks for soil and groundwater in this area are orders of magnitude below levels of concern for all scenarios evaluated.

2.4.10 SWMU – FORMER BULK CHEMICAL STORAGE AREA

The former Bulk Chemical Storage Area is a rectangular shaped parcel of land approximately 285 ft by 300 ft, or approximately 1.94 acres. It was purchased in 1968 from Clark Oil Company and included two (2) 500,000-gallon aboveground storage tanks and two (2) 300,000-gallon aboveground storage tanks that were used by Clark for fuel storage. After the 1968 purchase, raw materials used at the Queeny Plant were unloaded from a barge terminal, located on the west bank of the Mississippi River, and pumped into these tanks for storage. Materials stored at the terminal by Monsanto and others included: petroleum products, alkyl benzenes, blends of alkyl benzenes (Purex A-220 and Canadian A-221), Santicizer 154 plasticizer (p-t-butylphenyl diphenyl phosphate), monochlorobenzene, ortho-nitrochlorobenzene, sodium hydroxide, and potassium hydroxide. The use of this area was discontinued in 1987 and the tanks were removed. This area has at times been leased to other companies. No one is leasing this property at this time. The ground covering in this area is asphalt, crushed and compacted stone, and sparse volunteer vegetation. The SWMU is located outside of the Queeny Plant main property and site security fence, but is enclosed by a locked security fence.

Soils in the eastern portion of the area have been impacted by VOCs, semivolative organic compounds (SVOCs) and a few metals: primarily chlorobenzene, benzene, PAHs, and lead. Groundwater in the fill and silty clay and sand has been affected primarily by benzene and chlorobenzene. Under current conditions, constituents in soil and groundwater do not pose an unacceptable human health risk or hazard. However, the presence of chlorobenzene in soil poses a potential hazard under a hypothetical future indoor site worker scenario. As the site currently exists, lead does not pose a risk to any current or potential future receptors populations.

Two ecological assessment endpoints were identified for evaluating constituents in groundwater that may migrate to and result in potential effects in the Mississippi River adjacent to the Queeny plant. As a result, a groundwater model was developed to more accurately estimate concentrations of these constituents entering the Mississippi River. Evaluation of the resultant groundwater flows and constituent concentrations indicates these constituents are not of ecological concern in the Mississippi River (URS, 2002).

2.4.11 AOC – BUILDING KK

The KK Building Area is an area approximately 200 feet by 300 feet located west of the northwest corner of the KK Building. The KK Building is a warehouse that was used for the storage of dry materials. The area is now leased to others. The AOC is an area that was used for the unloading and bulk storage of various raw materials. The unloading and bulk storage area was constructed in the early to mid-1950s and dismantled in the early to mid-1980s. The ground covering in this area is asphalt, concrete, and crushed and compacted stone. The property has been used in the past for pilot production activities and was the location of storage buildings.

A limited set of VOCs, PAHs and metals are found in soils in the KK Building Area. The most significant impact is in the southwestern portion of the area and extending to a depth of approximately 6 ft. Groundwater in the fill and silty clay and sand units are impacted by combinations of VOCs (primarily PCE, chlorobenzene) and PAHs. The results of the evaluation of the human health risks for soil and groundwater in the KK Building Area are below levels of concern for all scenarios evaluated.

2.4.12 AOC – FORMER LAB WASTE FILTRATION UNIT AREA

The former Lab Waste Filtration Unit area was the location of an organic/water separator tank that was located underground in a concrete vault between Buildings AAA and BM. This organic-water separator was installed when the laboratory was built in the mid-1980s. The lab waste filtration unit collected wastewater from the laboratory facility prior to the wastewater being discharged into the Metropolitan Sewer District (MSD) sewer system. On a routine basis, this separator was taken out of service and the organic materials removed for off-site treatment and disposal. The filtration unit was used until a change in MSD standards prompted its removal on August 17, 1990. During the removal, the tank and vault were both observed to be in good condition and undamaged. The tank was removed and the concrete vault was backfilled with clean soil and paved over.

VOCs are the constituents of concern in this area. No analytes were detected in the soil samples collected from this AOC during the RFI data gap investigation and as such, there are no issues remaining with respect to this area. The results of the evaluation of human health risks for soil and groundwater in this area are below levels of concern for all scenarios evaluated.

2.5 FACILITY COMPLIANCE HISTORY

The following is a chronology of the regulatory compliance history relevant to groundwater monitoring, corrective action, and site/waste characterization at the Solutia Queeny Plant since the CME conducted in April 2001. A complete list of correspondence among Solutia, EPA and DNR can be found in the Agencies' RCRA files for Solutia.

04/26/01 DNR submits a CME to Solutia. The CME evaluated the technical and regulatory adequacy of the groundwater monitoring system implemented at the Solutia Queeny Plant.

05/29/01 Solutia submits response to the CME prepared by DNR.

07/24/01 Solutia submits request for additional time to submit draft Final RFI Data Gap Report. Extra time is necessary to complete the risk assessment portion of the report.

08/07/01 EPA and DNR grant extension request for submittal of draft final RFI Report.

01/10/02 Solutia submits RFI Data Gap Report to EPA and DNR. The RFI Data Gap Report included groundwater sampling at the Former Bulk Chemical Storage Area.

05/10/02 EPA and DNR submit first round of comments on the RFI Data Gap Report.

07/03/02 Solutia submits revised Data Gap RFI Report to EPA and DNR.

08/02/02 EPA and DNR submit second round draft review comments on the RFI Data Gap Report.

09/05/02 Solutia submits revisions to RFI Data Gap Report based on EPA and DNR's comments.

09/30/02 DNR transmits the *Environmental Indicator Evaluations for Current Human Exposures Under Control* (CA725) and *Migration of Contaminated Groundwater Under Control* (CA750) to Solutia. CA725 Human Exposures Under Control was coded as a "YES" and CA750 Migration of Contaminated Groundwater was coded as "IN" (insufficient information to make a determination).

10/08/02 EPA and DNR approve the RFI Data Gap Report and request Solutia to submit a CMS Work Plan.

12/17/03 Solutia submits notice of Chapter 11 Bankruptcy to EPA and DNR.

12/29/03 EPA and DNR submit comments regarding Work Plan for Additional Data Collected at Former Bulk Chemical Storage Area.

01/07/04 EPA and DNR approve the CMS Work Plan providing Solutia addresses specific comments in the CMS Report.

02/09/04 Solutia submits *Final Work Plan, Additional Data Collection at Former Bulk Chemical Storage Area* to EPA and DNR.

03/23/04 EPA and DNR approve *Final Work Plan, Additional Data Collection at Former Bulk Chemical Storage Area,* providing Solutia addresses specific comments during field procedures.

06/17/04 URS submits memo discussing additional characterization in the Former Bulk Chemical Storage Area and results of groundwater profiling near the Mississippi River to EPA and DNR.

06/28/04 URS submits memo to EPA and DNR discussing additional characterization in the Former Bulk Chemical Storage Area. Additional characterization included installation of additional piezometers to further delineate the lateral extent of LNAPL around PZ-5.

07/26/04 Solutia submits request for an extension for submittal of media cleanup goals to EPA and DNR. Additional time is needed to complete necessary fieldwork.

09/10/04 EPA and DNR approve a request for an extension for submittal of media cleanup goals.

11/12/04 EPA and DNR complete the *Migration of Contaminated Groundwater Under Control* (CA750) environmental indicator to Solutia. The CA750 was coded as "yes" migration of contaminated groundwater is under control.

3.0 ENVIRONMENTAL SETTING

3.1 REGIONAL GEOLOGY

3.1.1 STRUCTURAL FEATURES

The state of Missouri north of the Missouri River lies in the physiographic province classified as the Central Lowlands. The Ozark Plateau province lies south of the river, such that the City of St. Louis is geographically situated on the northeastern edge of the Ozark Plateau. St. Louis is situated on a monoclinal structure that is dipping to the northeast. This structure has additional associated features, including anticlines, synclines, and at least one fault. The St. Louis Fault is the nearest bedrock structure and is located 1.5 miles to the west. This vertical fault strikes N. 5° E. and has a net offset of 10 feet. The Solutia site is on the down-thrown side.

Additional structural features include the Cheltenham Syncline, Eureka-House Springs Anticline, and the Dupo-Waterloo Anticline. The axis of the Dupo Anticiline lies 2 miles east of the Solutia site. The Dupo Anticline strikes north-northwest and has a gentle slope on the east side and a steeper slope on the west side. This anticline has a history of natural gas production as well as a small amount of oil.

Mature karst topography has developed behind the bluffs on the major rivers where carbonates make up the bedrock just below the surface. Coalescing sinkhole fields, loosing streams and an extensive cave network are all present in upland areas where the bedrock is composed of soluble Mississippian limestone. Karst features are not as prevalent beneath areas covered with relatively insoluble Pennsylvanian-age shale and clay. The nearest notable karst feature to the Solutia site is a sinkhole in Lafayette Park located approximately 1.25 miles west-northwest of the site. Other sinkholes may be closer to the site, but their presence has been obscured by development.

3.1.2 SURFICIAL MATERIALS

Surficial materials in the St. Louis area consist of fill, alluvial deposits, and glacial materials. The glacial materials are expressed as till consisting of silt and clay with some gravel that tend to be very stiff. These materials may possibly be derived from loess or glacial lake deposits. The recognizable glacial materials generally occur along the Missouri, Mississippi, and Meramec Rivers. Most of the surface soils in southern and southwestern portions of the St. Louis area are formed from limestone residuum or from the loess.

3.1.3 STRATIGRAPHY

The following is a description of the bedrock stratrigraphy in the St. Louis Area as described in the book "*The Stratigraphic Succession in Missouri*"(1961), the *Comprehensive Groundwater Monitoring Evaluation, Solutia –Queeny Facility, St. Louis Missouri* (DNR, 2001), and *RFI Data Gap Investigation Report* (URS, 2002). A stratigraphic column listing the depth and thickness of the geologic formations in the St. Louis area is included in ***Table 1***.

The St. Louis Limestone formation of the Paleozoic Era, Mississipian System Meramecian Series is the first competent bedrock below the site (approximately 90 feet thick). It is a very hard light yellow to grayish rock, mostly pure carbonate but may contain some gray, breccia beds and dolomite pseudo-concretions. The Salem formation underlies the St. Louis limestone. The Salem formation (140 feet thick) is a white to blue-gray, argillaceous, locally oolitic, cross-bedded limestone. A distinctive "bulls-eye" chert nodule zone occurs near the top of the Salem formation and indicates the approximate contact with the St. Louis limestone. The Warsaw formation underlies the Salem formation. The Warsaw formation (approximately 110 feet thick) is buff to gray, argillaceous limestone interbedded with green calcareous shale.

The Burlington-Keokuk Limestone Undifferentiated Formation is the uppermost formation of the Mississippian System Osagean Series and is conformably overlain by the Warsaw formation of the Meramecian Series. The Burlington-Keokuk Limestone Undifferentiated Formation (approximately155 feet thick) is coarse grained, white to brownish-gray, cherty, crinoidal, massive limestone. The Fern Glen Formation underlies the Burlington-Keokuk Limestone Undifferentiated Formation. The Fern Glen Formation (approximately 60 feet thick) is a gray-green to red, fossiliferous, thickly bedded limestone with the upper portion of the formation being cherty. A thin red shale marks the bottom of the Fern Glen Formation. The undifferentiated Chouteau Group of the Kinderhookian Series underlies the Fern Glen Formation and forms the basal unit of the Mississippian System. The Chouteau Group (40 feet thick) is made up of discontinuous limestone and rests unconformably on top of the Devonian System.

The Devonian System is represented by the thin presence of the Grassy Creek Shale. The Grassy Creek Shale (3 to 20 feet) is a gray-black, fissile, carbonaceous shale. The Grassy Creek Shale rests unconformably on the undifferentiated Silurian dolomite. The Silurian dolomite (40 to 120 feet thick) is silty and contains some small amounts of chert.

The Silurian dolomite rests unconformably on the Ordovician-age Maquoketa Shale. The Maquoketa Shale (140 feet thick) is a blue-gray, often calcareous, platy shale. Below the Maquoketa Shale are some 2860 feet of Cambrian and Ordovician-age limestone, dolomite and sandstone that comprise the Ozark Aquifer. The Maquoketa Shale forms an important upper confining unit for the underlying Ozark Aquifer.

3.2 REGIONAL HYDROGEOLOGY

Regionally, groundwater in St. Louis City flows from west to east towards the Mississippi River. The quantity of producible groundwater in St. Louis City varies with depth and location. Large amounts of fresh water are stored in the bedrock and alluvium, although the alluvial aquifers are generally more productive than the bedrock aquifers. Alluvial wells can produce water up to a rate of 1000 gallons per minute (gpm). Shallow bedrock wells, with completion depths less than 300 feet, generally yield 10 – 15 gpm. However, deeper bedrock wells with completion depth deeper than 500 feet, can produce between 50 to 465 gpm.

Groundwater quality also varies greatly with depth and location. Shallow groundwater from wells completed in Pennsylvanian-age bedrock generally has a higher content of dissolved solids than groundwater from wells completed in alluvium or the deeper Mississippian, Ordovician, and Cambrian bedrock. All shallow sources of groundwater are subject to pollution because of sinkholes, fractures and enlarged bedding planes that allow surface water to enter the shallow aquifers.

Based on a review of the region on behalf of EPA in 1989, it was determined that no drinking water supply wells exist within a one-mile radius of the Queeny plant. Solutia's water supply comes from the City of St. Louis, whose source is the nearby Mississippi River. There are two city water supply intakes near Solutia; one 1.5 miles upstream to the north and another 5 miles upstream to the north. The nearest downstream water intake is 68 miles to the south in Chester, Illinois.

3.3 SITE-SPECIFIC GEOLOGY

The site area is considered to be part of the Mississippi River floodplain. A significant amount of development has occurred over the past 200 years and the associated filling activities have raised the ground surface elevation and extended it eastward. This increased ground surface elevation and area, combined with the floodwall, which is immediately east of the property, has shifted the eastern edge of the flood plain east of the site (URS, 2002). The surficial fill material consists mainly of clay, silt, sand and debris. Underlying the surficial fill are glacial, alluvial, and colluvial deposits. The glacial material generally consists of gravel, sand, and silt, which are very dense to hard, originating as colluvial-fluvial materials deposited by melt-waters. The alluvial and colluvial deposits consist of interbedded sand, silt, and clay that were laid down on top of the glacial deposits by the current Mississippi River. Colluvial deposits were deposited concurrently with alluvial deposition at the flood plain margin. The general grain-size of alluvial-colluvial deposits above the bedrock becomes coarser with depth, from clay to sand. Four stratigraphic units have been identified beneath the facility: fill, silt and silty clay, sand, and bedrock.

3.3.1 FILL

Fill is the most extensive and continuous overburden unit, with thickness ranging from 2-32 feet in the northern portions of the site. The fill material is comprised of both native alluvial soils and non-native debris such as ash, cinders, bricks, glass, pottery, construction debris, coal fines, and gravel. In the former Lasso production area, the fill was noted to contain chat. In the quarry area, the mined rock has been replaced with over 100 feet of fill material. The quarry walls are thought to be nearly vertical extending up 100 feet to an elevation of 400 feet above mean sea level. Fill in the former coal yard is overlain with two feet of a coal layer.

3.3.2 SILTY CLAY

Below the fill, across most of the site, is a relatively lower permeability fine-grained alluvial silt and clay unit with some areas of clayey silt and interbedded sand seams. The silty clay is absent in some areas across the site, predominately in the former Quarry Area where the overburden was removed during the quarrying of the underlying limestone. The silty clay is generally a mixed gray to brown to yellow in color. The thickness ranges from four to ten feet thick at the bedrock high and can be 30 feet or greater in the northern and southern portions of the site. The sand seams are usually water saturated and generally appear to be physically and hydraulically isolated.

3.3.3 SAND

In the northern and southern portions of the site a sand unit underlies the silty clay and extends to bedrock. The sand is absent in the central portion of the site where a bedrock high exists. On the bedrock high, the silty clay directly overlies the bedrock. The sand unit in the northern portion of the site consists of a light brown to grayish brown, moist to wet, fine to medium-grained sand. This sand unit varies in thickness between 50 and 60 feet before it thins to the south, southwest, and southeast towards the bedrock high in the middle of the site. Sand in the southern portion of the site, near the coal storage yard and bulk chemical storage area, is an olive gray, brown, or tan, moist fine-grained sand unit that grades downward to a more coarse-grained sand. This sand unit varies in thickness from 22 feet to 53 feet.

3.3.4 LIMESTONE BEDROCK

The upper bedrock identified at the Solutia site is a limestone from the St. Louis Formation of the Meramecian Series. The limestone is described in boring logs from the facility as finely to coarsely crystalline, fractured, and weathered. Fractures may be filled with clay or secondary mineralization.

The bedrock surface is uneven with a topographic high near the center of the site and lows in the north and south. The bedrock surface generally slopes to the west towards the Mississippi River. The northern bedrock low near **MW-2** may reflect a former **erosional** stream channel. In the area of the bedrock high the shallowest depth to bedrock is less

than 10 ft. Away form the bedrock high, the depth to bedrock is as much as 91 feet bgs. In the southeastern portion of the site, a former limestone quarry extended to over 100 feet bgs. The quarry has since been filled.

3.4 SITE-SPECIFIC HYDROGEOLOGY

Groundwater at Solutia is encountered within three major water bearing zones: fill and silty clay, sand, and bedrock. Local groundwater flow and direction at Solutia is influenced by the bedrock high noted in the central portion of the site. The shallow groundwater in this area generally flows radially off the bedrock high and then turns back east toward the river once it is off the bedrock high. The upper most zone is within the fill and silty clay that together covers the entire site. The majority of the water in this zone is contained within the various sand lenses encountered in the silty clay, however, there are some zones of granular material in the fill that yield water. The sand unit represents the major groundwater migration pathway due to its hydraulic properties (i.e., relatively thick and permeable). Groundwater in the bedrock unit is believed to generally flow east toward the Mississippi River. The primary flow path is considered to be through openings in the bedrock, which could include fractures, joints, bedding planes, or solution cavities.

3.4.1 FILL AND SILTY CLAY

Precipitation infiltration is expected to migrate downward into the fill and silty clay and further downward into the sand units. The groundwater in wells screened within the fill and silty material typically lie 6-10 feet bgs. With the absence of any significant sandy alluvium in the center of the site, shallow groundwater appears to migrate radially away from the bedrock high near the former Lasso™ production area prior to migrating more towards the Mississippi River. Groundwater originating north of the bedrock high appears to migrate towards the northwest and down into the sand prior to migrating east toward the Mississippi River. In the southern portion of the facility, groundwater flow direction appears to be towards the southeast.

Slug tests were performed on various wells and the potential communication between the groundwater within the fill and silty clay unit and the river was evaluated. These tests which effectively measure the most permeable material in the screened zone produced hydraulic conductivity values of 5.1×10^{-5} to 1.1×10^{-1} centimeters per second (cm/sec) for the fill and silty clay. The more permeable granular material in the fill or sandy lenses in the silty clay influence these higher values. In addition, negative or only minor communication between the groundwater in the fill and silty clay and the river was identified (OBG, 1999). As such, they do not represent a significant groundwater migration pathway to the river. At nested well locations, comparison of the potentiometric surface between wells screened in the fill and silty clay with those screened in the underlying sand shows a downward vertical gradient. Therefore, the thin lenses of permeable material in the fill and silty clay unit are isolated and do not exhibit significant communication with the river, but primarily serve a connective media with the underlying sand.

Calculated groundwater flow gradients in the fill range from 0.004 feet per foot (ft/ft) to 0.011 ft/ft, and calculated velocities ranged from 0.89 – 1.57 feet per day (ft/day). In the silty clays, the hydraulic gradient was calculated in a range from 0.006-0.009 ft/ft. Calculated velocities ranged from 0.007 – 1.013 ft/day.

3.4.2 SAND

The entire thickness of the sand unit is generally confined with depths to water ranging from approximately 17 feet to 35 feet bgs. The unit is confined by the overlying silty clay. The groundwater flow direction in the sand is generally east, toward the river. Slug tests and pump tests conducted at the site produced hydraulic conductivity values of $5.6x10^{-2}$ cm/sec for the sand located north of the bedrock high, which is within the anticipated range. In addition, evaluation of the communication between the sand unit and the river showed a positive relationship between river stage and groundwater elevation (OBG, 1999). The hydrogeologic properties are believed to be similar in the sand to the north and to the south of the bedrock high. A comparison of the potentiometric surface in wells screened at different depths in the sand unit shows very little vertical component, which indicates that flow is generally horizontal. This indicates that the sand unit is the primary pathway for offsite migration and suggests that if any communication with bedrock exists, it does not induce a vertical gradient with the sand unit. In the sands, hydraulic gradients ranged from 0.001-0.02 ft/ft and velocities from 3.94 – 5.25 ft/day.

3.4.3 LIMESTONE BEDROCK

Groundwater flow in the bedrock is typically through fracture, joint, bedding plane, and solution cavity systems and therefore does not have the same characteristics as porous media flow (as in the sand or silty clay). The flow direction in the bedrock is largely influenced by the orientation of corresponding fractures, joints, bedding planes, etc. in addition to recharge from or discharge to the river and the driving head of groundwater. Depth to groundwater in bedrock wells resembles depths in nearby sand wells, ranging from 10 feet to 33 feet below ground surface. Closer to the river, bedrock wells have potentiometric surfaces that are slightly higher than adjacent wells screened in the sands.

Seven monitoring wells are screened in bedrock, including monitoring wells **MW-2R, MW-8R, MW-13R, MW-21R, OBW-1, OBW-2,** and **OBW-3**. Monitoring well **MW-2R, MW-8R, OBW-1** and **OBW-2** are bedrock wells above where the sand unit is present. Wells **MW-2R** and **MW-8R** are located along the eastern perimeter of the site and have associated wells **MW-2B** and **MW-8B** screened in the sand. Comparison of water levels in these wells show an upward hydraulic gradient. Wells **OBW-1** and **OBW-2** do not have associated wells screened solely in the sand.

Wells **MW-13R, MR-21R**, and **OBW-3** are located in the bedrock high where the sand unit is absent. The bedrock in this area is overlain with the fill and silty clay units. Well **MW-13R** has an associated shallow well **MW-13**. Water levels in these wells suggest a downward gradient.

Well **OBW-3** is located near well **MW-9**, which is screened in the fill/silty clay unit. Water levels reported for these two wells suggest a downward hydraulic gradient. **MW-21R** is located in the bedrock high and there are no shallow wells in the vicinity of this well.

These results suggest that flow near the bedrock high area is vertically downward from the fill and silty clay to bedrock and, as the distance away from the bedrock high increases, there is a reversal in the vertical direction of flow and flow is from bedrock to the sand unit. Horizontal groundwater flow in the upper limestone bedrock appears to be east-northeast toward the Mississippi River under an approximate hydraulic gradient of 0.007 ft/ft.

3.5 GROUNDWATER MONITORING SYSTEM

The current network of groundwater monitoring wells at Solutia have been constructed during numerous phases of groundwater investigations. Twenty-eight groundwater monitoring wells were installs as part of preliminary investigations in 1983 and 1984. Thirteen monitoring wells and four DNAPL recovery wells were installed in 1988 as part of the Building FF, Acetanilides Production Area, and Coal Storage Yard investigations. The Phase I RFI investigation in 1992 resulted in the installation of five groundwater monitoring wells, one 8" diameter test well, and a 4" diameter observation well. In the summer of 2000, Solutia completed an additional 13 monitoring wells as part of the RFI Data Gap Investigation. Solutia has reported that 16 of the wells have been closed, though no abandonment information has been documented. Additionally, wells **GM-4** and **GM-5** have been paved over and "lost". There are currently 66 monitoring wells on-site. A figure showing monitoring well locations is included in ***Appendix A*** and monitoring well construction diagrams are included in ***Appendix B***.

4.0 OPERATION AND MAINTENANCE INSPECTION

4.1 SAMPLING AND ANALYSIS PLAN

Solutia is currently in the process of evaluating the current groundwater monitoring system and recent analytical groundwater monitoring results to aid in developing a long-term groundwater monitoring program. It is anticipated that a long-term groundwater monitoring program will be implemented on an appropriate site-specific frequency until site-specific groundwater cleanup objectives can be demonstrated.

The SAP is written documentation detailing the overall operation of the groundwater monitoring system. Solutia must develop a SAP, as required by 40 CFR 265.92(a), for the groundwater monitoring wells at the facility. The purpose of the SAP is to document the procedures used in sampling and analysis of groundwater monitoring wells such that these procedures are done in a proper and consistent manner regardless of the personnel involved. The SAP should be available to field personnel at all times. This includes contractors performing groundwater monitoring tasks for the facility. Field personnel should be thoroughly familiar with the content of the site-specific SAP and are responsible for strict adherence to the SAP procedures.

The GWU emphasizes the importance of the SAP not only in terms of required documentation, but also to ensure that field personnel not familiar with the site can easily determine the scope and specifics of the project. The SAP must be made available to the field sampling personnel so that plans can be made concerning the number of persons required to carry out the sampling operation, number of sample bottles required, required safety apparatus, and other logistical considerations. Without the required site-specific plan, it is conceivable that a haphazard sampling operation can result. This may also lead to groundwater samples and groundwater elevations that are not representative of the monitored formations.

The DNR Sampling and Analysis Plan Worksheet outlines the DNR's expectations for an adequate SAP. A copy of this worksheet is contained in ***Appendix C.*** Solutia should review this checklist evaluation for specific requirements concerning drafting their SAP. The following discussion contains a recommended format for preparing an adequate SAP for the Solutia John F Queeny Plant.

There are four major required elements of the SAP. They are:

(1) Field Sampling Procedure Guide;
(2) Operation and Maintenance Plan;
(3) Health and Safety Plan; and
(4) Laboratory and Field Quality Assurance/Quality Control (QA/QC) plan.

All of these elements should be contained in one document, and should be entitled *Solutia Inc., John F. Queeny Plant Sampling and Analysis Plan.*

- Perhaps the most important element of the field sampling procedure guide is a facility map, with each of the monitoring wells located properly in scale on the map. The monitoring wells should be clearly labeled, and documentation should be provided indicating the total well depths, degree of contamination, estimated recovery time after well evacuation, frequency of sampling (i.e., including the precise quarter(s) when sampling will be conducted), parameters to be analyzed, and other useful information for the field sampling team. The GWU reiterates the importance of this information not only in terms of documentation, but also to familiarize any new sampling personnel to the site-specific aspects of the facility.

  The GWU feels that the aforementioned site-specific parameter list must, at a minimum, include provisions for obtaining pH, specific conductivity, and temperature in the field. A discussion must be included describing the instruments that will be used to obtain these required measurements. In addition, calibration procedures and frequency of calibration must be specified for each instrument. These field measured groundwater parameters are important as an aid in evaluation of the downhole monitoring well integrity (i.e., elevated pH could mean that grout contamination is occurring), and may provide a simple means of determining potential groundwater contamination movement. In addition, it is possible to use the stabilized values of these parameters to evaluate the wellbore volume that needs to be evacuated in order to obtain representative groundwater samples.

  Solutia must provide the order for sampling monitoring wells in this portion of the SAP. The GWU recommends that the SAP contain a list of monitoring wells to be sampled, in order, from least contaminated to most contaminated.

  Non-dedicated sampling equipment must be thoroughly decontaminated to prevent cross-contamination of samples. The GWU generally recommends that non-phosphate based detergent be used for the first cleaning, followed by a rinse with tap water, then a deionized or distilled water rinse, and finally a pesticide grade hexane rinse for VOCs. These procedures are generally accepted decontamination practices that are outlined, in detail, in the EPA Technical Enforcement Guidance Document (TEGD).

- The second element of the SAP is the Operation and Maintenance Plan (OMP). This portion of the SAP is required so that the GWU can evaluate whether the facility is performing adequate routine maintenance of the groundwater monitoring system, including: downhole problems which may develop due to excessive siltation in the wellbore; ruptures in the casing, deterioration of the bentonite annular seal; downward migration of groundwater through voids in the grout, etc. The OMP must also address the condition of the surficial components of the groundwater monitoring system, including casing risers, surface well seals, monitoring well security systems (locking caps, hinges, etc.), casing riser protection systems (marker posts, etc.), monitoring well identification markers, annular space between the inner and outer casing risers, dedicated equipment left hanging in the wellbore, and general condition of the area immediately surrounding the monitoring wells.

The OMP must specify a schedule for performing the routine inspections of the monitoring system components, and the method that will be used to evaluate the adequacy of individual components. The GWU recommends that Solutia prepare a checklist-style worksheet that can be used by sampling personnel on a quarterly basis to evaluate these components. A worksheet should be completed for each monitoring well sampled during the regular sampling events, and the completed document should be placed in the facility's OMP logbook. This logbook must be kept current, and the results of the inspections and/or repairs and/or replacements must be kept for a period of three years. This may include well redevelopment in cases of excessive wellbore siltation and/or screen occlusion, monitoring well replacement in cases of downhole casing deterioration, bailer replacement in cases of excessive damage, monitoring well repair or replacement in cases of damage to the riser, well apron repair or replacement in cases of frost heaving, etc.

The results should be routinely reported to the GWU, and, it would be appropriate to discuss the ongoing operation and maintenance activities in the Annual Groundwater Report due on March 1 of each year. This update on the operation and maintenance aspects of groundwater monitoring should also include the checklist worksheets (or equivalent) for each monitoring well, and should discuss any repairs and/or replacement of monitoring system components.

- The third element of an adequate SAP is the Health and Safety Plan (HSP). The HSP is intended to specify the level of personnel protective equipment (PPE) for individuals involved in sampling activities as well as procedures that will be followed to protect human health and the environment during emergencies. It is Solutia's responsibility to determine what level of PPE is required for their sampling personnel. It is also Solutia's responsibility to determine what Occupational Health and Safety Administration (OSHA) requirements for PPE apply to their sampling personnel. This includes any contractors hired to conduct sampling.

  The next element that should be contained in the HSP is a site-specific emergency contingency plan in the event that an unexpected release of hazardous waste constituents occurs, or an injury to field personnel takes place. This portion of the HSP should include the name(s) of the designated emergency coordinator(s) at the site, along with procedures to be followed in the event of an emergency. These procedures should include telephone numbers of the designated emergency coordinator(s), along with telephone numbers of the substitute emergency coordinator(s) in the event that the primary emergency coordinator is not available. In addition, the HSP must specify the telephone numbers of emergency response units including the local fire department, appropriate law enforcement agencies, and the Environmental Emergency Response Unit at the DNR. Directions to and a map of the route to the nearest hospital should also be included in the HSP. A plan must be developed which describes the procedures that will be followed during an emergency at the Solutia facility, and this plan must be included in the Solutia SAP.

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- The fourth element of the SAP describes laboratory and field QA/QC procedures that are utilized at the contract laboratory and/or the facility laboratory. Solutia currently employs the services of an outside contract laboratory. This required portion should be relatively easy to incorporate into the SAP. Laboratories involved in the analysis of groundwater samples from hazardous waste sites should have prepared a generic document describing the procedures that will be used to ensure that proper quality assurance/quality controls are used in their laboratory. These QA/QC procedures include spiked sample preparation and analysis, proper equipment calibration procedures, analytical verification procedures, and other general measures to be taken to ensure the validity of analytical data. Solutia should contact their contract laboratory to obtain a copy of this required documentation, and include it as an attachment to the SAP.

  In addition to QA/QC procedures in the laboratory this portion of the SAP should describe the general QA/QC procedures that are required in the field. These procedures may include the preparation of equipment blanks in cases where non-dedicated sample collection equipment is being used, the preparation of trip blanks for each sample container type being used during the sampling event, and duplicate sample collection as an aid in the evaluation of the adequacy of sample handling and analysis techniques.

  Equipment blanks are required for all non-dedicated sampling equipment. The GWU recommends that the equipment blanks should, at a minimum, consist of 10% of the total number of samples obtained during the sampling event. The GWU recommends that the number of duplicate samples collected during a sampling event be a minimum of 10% of the total samples collected. QA/QC results must be reported with the associated groundwater data and used to validate the groundwater data.

  The GWU again emphasizes the importance of the SAP document. The GWU recommends that Solutia consider these comments and refer to the DNR-SAP Worksheet when drafting a facility SAP. Finally, Solutia will be required to make this document available to sampling personnel including contracted consultants responsible for sampling and analysis of the groundwater monitoring system. Solutia must keep a copy of this document on-site. Solutia will be responsible for any deviation from the SAP and for the required operation and maintenance aspects of the OMP.

  As required by 40 CFR 265.92(a) Solutia must develop a Sampling and Analysis Plan (SAP) for the groundwater monitoring wells at the facility. The SAP is written documentation detailing the overall operation of the groundwater monitoring system. The purpose of the SAP is to document the procedures used in sampling and analysis of groundwater monitoring wells such that these procedures are done in a proper and consistent manner regardless of the personnel involved. The SAP should be available to field personnel at all times. This includes contractors performing groundwater monitoring tasks for the facility. Field personnel should be thoroughly

familiar with the content of the site-specific SAP and are responsible for strict adherence to the SAP procedures.

Solutia must be advised that the SAP is a dynamic document that reflects current groundwater monitoring conditions at the site. Once the Post Closure Permit is finalized the SAP will need to be revised to reflect the change in the sampling frequency and type of monitored parameters to be consistent with the permit.

4.2 PHYSICAL WELL INTEGRITY INSPECTION

An inspection of the physical monitoring well integrity was performed by Kurt Hollman of the department's GSRAD on March 2 and 3, 2005. Sixty-six monitoring wells were inspected for physical integrity with regard to surface seals, inner and outer casings and general well condition. A copy of the Measurement Purging and Well Integrity Worksheet completed by GSRAD is included in ***Appendix D.***

There are several different types of monitoring wells used at the Solutia facility. The condition of the monitoring wells continues to vary from newly installed completions in good condition to older wells that are severely deficient. The newer wells included both above grade and flush mount completions.

The older monitoring wells had a number of deficiencies:

- Fourteen wells had broken, lifted or cracked surface seals. Fourteen wells had no apparent surface well seal. These wells either lacked a permanent surface seal or had them buried beneath soil or debris.

- A hole has developed through the top of the concrete surface well seal at the base of **MW-27**.

- Nine of the monitoring wells lacked sufficient collision protection. Collision protection is especially needed in areas of on-going construction or busy parking lots. Monitoring well **HW-3** has suffered severe damage due to collision and should be reconstructed, if possible, or abandoned. Monitoring well **MW-2A** has suffered a collision resulting in a dented protective casing and a missing locking cap. Several bumper posts at site wells are leaning and have broken concrete foundations indicating previous collisions.

- None of the protective well casings, in both new and older wells, were protected with weep holes. Standing water was found inside the annulus of **MW-11B**. Weep holes drain water that can accumulate within the well annulus, cause corrosion, and shorten the useful life of the monitoring well.

- Not all of the wells had a permanent depth-measurement reference point. Some wells had a black marker at the top of riser to indicate the measurement reference point. Other wells were measured from the lock side of the riser.

- Many wells are not clearly identifiable. Most flush mount wells lack exterior identification. Numerous above ground completions, even new construction, also lack identification. A site map is often used to help identify monitoring wells. All wells should be clearly identified; such as stenciling well numbers on the ground near flush mount wells or on casing risers for above grade well completions.

Solutia must address these deficiencies. This is especially important for those wells that will be included in the long-term groundwater monitoring program. Those wells that are not included in the long-term groundwater monitoring program should be abandoned in accordance with GSRAD well regulations in 10 CSR 23-4.080.

4.3 WATER LEVEL MEASUREMENT AUDIT

The static water level and total well depth measurements were audited in monitoring wells **MW-3** and **REC-1**. Kurt Hollman of the department's GSRAD audited water level measurements on March 2 and 3, 2005. Comparison of GSRAD's and Solutia's water level measurements is included in ***Table 3*** and physical properties of the water are included in ***Table 4.***

The static water level and total well depth measurement audit showed close agreement between Solutia and GSRAD. On average GSRAD measured water levels 0.01 feet deeper than Solutia. On average the GSRAD measured total well depths 0.10 feet shallower than Solutia. Most discrepancies in measurement values may be attributed to small differences in measuring technique and /or equipment calibration. The small average differences in measurements indicates that accurate water levels are being collected during regularly scheduled sampling periods.

4.4 FIELD GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

The field sampling effort and field measurement procedures used by Solutia sampling personnel were observed and critiqued by ESP representatives Mr. Eric Sappington and Mr. Scott Robinett on March 2 and 3, 2005. URS, consultants for Solutia, had three field staff on-site: Jeff Adams, Justin Prien, and Mike Corbett. A copy of the Groundwater Monitoring Field Audit Report completed by the ESP is included in ***Appendix E.***

The field audit conducted by the ESP included the collection of split groundwater samples for independent analyses at the state environmental laboratory within the ESP. ESP field personnel collected split samples from monitoring wells **MW-3, Rec-1, Rec-4,** and **LPZ-5.**

Each well was evacuated and sampled by the URS sampling team using a non-dedicated SS Monsoon, Proactive, stainless steel and Teflon impeller-driven pump. The main tubing attached to the pump was dedicated and made of low-density polyethylene (LDPE). Micropurging, or low-flow, techniques were used to evacuate each well prior to collecting samples. A non-dedicated flow-through cell at the well head was used to measure field parameters. Field parameters (pH, specific conductance, temperature,

dissolved oxygen, and oxidation-reduction) were used to determine when each well was stabilized and ready to sample. The static water level was measured throughout the evacuation procedure to ensure that excessive drawdown was not occurring. Each well was sampled immediately after it was determined that the field parameters had stabilized. All non-dedicated equipment was decontaminated between wells. Since micropurging techniques were used, there was very little evacuation wastewater to manage. The small quantity or evacuation water that was generated was collected and stored temporarily on-site until proper disposal could be arranged.

All non-dedicated sampling equipment (the pump, the flow-through cell and water quality probes, the sampling valve, and the water level indicator) was decontaminated with a distilled water and Liquinox solution between wells. The soap solution was cycled through the pump for several minutes. All equipment was rinsed with distilled water and wiped dry with paper towels.

Equipment blanks were collected by cutting the top off of a new one-gallon container of distilled water, placing the pump in the container, cycling the water through the pump, and collecting a sample of the distilled water as it flowed out of new tubing attached to the pump outlet. Equipment blanks are collected once during each sampling event or once for every 10% of the samples collected, whichever is more frequent. The equipment blank was analyzed for VOCs.

All samples collected by ESP were given a numbered label and placed on ice in a cooler. A chain-of-custody form was completed, which recorded the label numbers assigned to each sample, the description of the location of the sample collected, the time and date collected, and the parameters to be analyzed. ESP sampling personnel maintained custody of the samples by hand delivering them to the State Environmental Laboratory within the ESP in Jefferson City where they were relinquished to laboratory personnel.

Overall, field sampling was accomplished using proper protocols. However, there are a couple of items that must be addressed:

- While Solutia's sampling personnel typically held their VOC vials at an angle when filling in order to minimize aeration, there were a couple of occasions when they were observed holding the vial completely vertical which resulted in a few air bubbles being generated. The air bubbles were allowed to pop prior to closing the container so that there was no headspace in the vial. This procedure was discussed in the field with Solutia sampling personnel and corrected. Care should be taken to minimize aeration when collecting samples for VOC analysis.

- Solutia sampling personnel calibrated the pH meter using a one-point calibration to a 7-pH buffer. According to Solutia personnel, this calibration procedure is recommended by the manufacture of the pH meter. Standard protocol for pH meter calibration requires two-point calibration, making an effort to use buffers that will bracket the expected pH value of the sample.

4.5 SPLIT-SAMPLING RESULTS

Part of an Operation and Maintenance Inspection Report involves a comparison between the department's analytical field/laboratory results and those submitted by a facility for the corresponding sampling event. On March 2 and 3, 2005, Mr. Eric Sappington and Mr. Scott Robinett of DNR's ESP, split samples with sampling personnel from Solutia. ESP collected split samples from the monitoring wells identified as **MW-3, REC-1, REC-4,** and **LPZ-5.**

ESP measured field parameters for pH, specific conductance, and temperature and collected groundwater samples for volatile organics, base neutral/acid extractable organics, lead and arsenic at each well. Solutia sampled for volatile organics, dissolved gases, chloride, alkalinity, carbon dioxide, sulfate, nitrate, and total organic carbon. The split samples, between ESP and Solutia, were collected directly from tubing attached to the pump outlet by alternately filling sampling containers. Sampling containers were filled in order of decreasing order of volatility (VOC, BNA, and metals).

Overall, analytical results for VOCs between ESP and Solutia compared favorably. Especially for those constituents that yielded actual results. However, there were several constituents especially in monitoring wells **REC-1, REC-4,** and **LPZ-5**, where the laboratory detection limit was well above regulatory levels. The detection limit in monitoring well **REC-4** was <100 parts per billion (ppb) or micrograms per liter (µg/L) for benzene, trans –1,2-dichloroethene, toluene, and vinyl chloride; while ESP's results for theses constituents in monitoring well **REC-4** were 4.88 ppb, 47.1 ppb, 3.3 ppb, and 76.0 ppb, respectively. Solutia's results for **REC-1** were <100 ppb for benzene chlorobenzene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, toluene, and vinyl chloride; while ESP's results for these constituents **REC-1** were <0.5 ppb, 211 ppb, 49.8 ppb, 0.57 ppb, 1.87 ppb, and <0.5 ppb, respectively. Solutia's results for **LPZ-5** were <500 ppb for benzene, cis-1,2-dichloroethene, tran-1,2-dichloroethene, tetrachloroethene, trichloroethene, and vinyl chloride; while ESP's results for these constituents for **LPZ-5** were 129 ppb, 154 ppb, <50 ppb, 394 ppb, 181 ppb, and <50 ppb, respectively. Every effort should be made by the analytical laboratory to obtain laboratory detection limits that are at or below the regulatory levels.

ESP also obtained field measurements for physical parameters of pH, specific conductivity, and temperature. Comparison of field parameters shows close agreement between ESP and Solutia.

ESP's laboratory results and field parameter measurements are included in ***Appendix E*** and Solutia's laboratory results and field parameter measurements are included in ***Appendix F.*** A tabulated summary comparing analytical results is included in ***Table 4*** and a tabulated summary comparing field parameter measurements is included in ***Table 5.***

4.6 ANNUAL GROUNDWATER MONITORING REPORT

Once a final remedy is selected, it is expected that a long-term groundwater monitoring program will be implemented on an appropriate site-specific frequency until site-specific groundwater cleanup objectives can be demonstrated. As part of the long-term groundwater monitoring program Annual Groundwater Monitoring Reports should be developed and submitted to the department by March 1 of the following year. The purpose of the Annual Groundwater Monitoring Report is to document the sampling results and activities, operation and maintenance of the groundwater monitoring system and the adequacy of the monitoring system at the facility for the year.

A copy of the Annual Report Review Worksheet used by DNR is included in ***Appendix G.*** Solutia should review this worksheet for specific requirements concerning drafting an annual report. The following is a list of important items that should be included in the Annual Report.

- The report should contain a brief discussion of the site history and background, a discussion of the nature and evolution of the groundwater monitoring system, and conclusions regarding the adequacy of the monitoring system.
- The report should include discussion or a table showing monitoring wells to be sampled, frequency of sampling, and analytical parameters.
- The report should include a detailed map of the facility showing monitoring well locations and a table listing groundwater monitoring parameters and sampling frequency.
- Static groundwater elevations, groundwater elevation contour maps, field parameter measurements and analytical results for each sampling event should be included in the annual report. In addition to a summary of analytical results the annual report should include the analytical laboratory data, quality assurance/quality control data, field sampling log sheets, and chain of custody documents.
- An evaluation of the horizontal and vertical gradients, groundwater flow direction, and rate of groundwater flow must be included for determining the rate and extent of contaminant migration.
- A comparison of the measured total depth with the as-built well depth to determine the percent of wellbore siltation. The well screen occlusion criteria for redevelopment of the wellbore should be between 5 and 10% of the screened interval.
- The report should include a summary of monitoring well operation and maintenance activities, new well installation, exploratory drilling, or characterization activities that have been performed during the year.

5.0 CONCLUSIONS

This section presents concerns identified within the body of this report which the DNR considers inadequate elements of Solutia's groundwater monitoring program. The detailed rationale and documentation for each issue are included in the body of the report and the appendices. A brief characterization of each issue and the appropriate regulatory citations are provided.

5.1 SAMPLING AND ANALYSIS PLAN

The SAP is written documentation detailing the overall operation of the groundwater monitoring system. The purpose of the SAP is to document the procedures used in sampling and analysis of groundwater monitoring wells such that these procedures are done in a proper and consistent manner regardless of the personnel involved. The SAP should be available to field personnel at all times. This includes contractors performing groundwater monitoring tasks for the facility. Field personnel should be thoroughly familiar with the content of the site-specific SAP and are responsible for strict adherence to the SAP procedures.

Once a final remedy is selected, it is expected that a long-term groundwater monitoring program will be implemented on an appropriate site-specific frequency until site-specific groundwater cleanup objectives can be demonstrated. Solutia must develop a site-specific SAP as part of long-term groundwater monitoring at the site. The Sampling and Analysis Plan Worksheet outlines DNR's expectations for an adequate SAP. A copy of this worksheet is contained in ***Appendix C.*** Solutia should review this checklist evaluation for specific requirements concerning drafting their SAP.

5.2 PHYSICAL WELL INTEGRITY INSPECTION

As required by 40 CFR 265.92(a), monitoring wells must be constructed in a manner that maintains the structural integrity of the well-bore and completed in a manner which enables collection of representative groundwater samples. Overall, GSRAD's evaluation of the monitoring well integrity revealed that the wells are structurally sound. However, the GSRAD inspection revealed the following deficiencies:

- Fourteen wells had broken, lifted or cracked surface seals. Fourteen wells had no apparent surface well seal. These wells either lacked a permanent surface seal or had them buried beneath soil or debris.

- A hole has developed through the top of the concrete surface well seal at the base of MW-27.

- Nine of the monitoring wells lacked sufficient collision protection. Collision protection is especially needed in areas of on-going construction or busy parking lots. Monitoring well HW-3 has suffered severe damage due to collision and should be reconstructed, if possible, or abandoned. Monitoring well MW-2A has

suffered a collision resulting in a dented protective casing and a missing locking cap. Several bumper posts at site wells are leaning and have broken concrete foundations indicating previous collisions.

- None of the protective well casings, in both new and older wells, were protected with weep holes. Standing water was found inside the annulus of MW-11B. Weep holes drain water that can accumulate within the well annulus, cause corrosion, and shorten the useful life of the monitoring well.

- Not all of the wells had a permanent depth-measurement reference point. Some wells had a black marker at the top of riser to indicate the measurement reference point. Other wells were measured from the lock side of the riser.

- Many wells are not clearly identifiable. Most flush mount wells lack exterior identification. Numerous above ground completions, even new construction, also lack identification. A site map is often used to help identify monitoring wells.

Solutia must address these deficiencies. This is especially important for those wells that will be included in the long-term groundwater monitoring program.

5.3 WATER LEVEL MEASUREMENT AUDIT

The static water level measurement and total well depth measurement audits showed close agreement between Solutia and GSRAD. On average GSRAD measured water levels 0.01 feet deeper than Solutia. On average the GSRAD measured total well depths 0.10 feet shallower than Solutia. The small discrepancy is most likely due to a difference in equipment calibration and/or measuring technique. The small difference in measurement values indicates that accurate water level data is being collected during regularly scheduled sampling events.

5.4 FIELD GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

Overall, the field sampling effort conducted by Solutia was satisfactory as observed by ESP. Sampling procedures must produce samples representative of groundwater beneath the facility as required by 40 CFR 265.91(a)(2), 265.93(d)(4) and 265.93(d)(7). There are a few items that must be addressed to satisfy these requirements:

- While Solutia's sampling personnel typically held their VOC vials at an angle when filling in order to minimize aeration, there were a couple of occasions when they were observed holding the vial completely vertical which resulted in a few air bubbles being generated. The air bubbles were allowed to pop prior to closing the container so that there was no headspace in the vial. The procedure was discussed in the field with Solutia sampling personnel and corrected. Care should be taken so as to minimize aeration when collecting samples for VOC analysis.

- Solutia sampling personnel calibrated the pH meter using a one-point calibration to a 7 pH buffer. According to Solutia personnel, this calibration procedure is recommended by the manufacture of the pH meter. Standard protocol for pH meter calibration requires two-point calibration, making an effort to use buffers that will bracket the expected pH value of the sample.

5.5 SPLIT-SAMPLING RESULTS

Part of an Operation and Maintenance Inspection Report involves a comparison between the department's analytical field/laboratory results and those submitted by a facility for the corresponding sampling event. On March 2 and 3, 2005, Mr. Eric Sappington and Mr. Scott Robinett of DNR's ESP, split samples with sampling personnel from Solutia. ESP collected split samples from the monitoring wells identified as **MW-3, REC-1, REC-4,** and **LPZ-5.** ESP's laboratory results and field parameter measurements are included in ***Appendix E*** and Solutia's laboratory results and field parameter measurements are included in ***Appendix F.*** A tabulated summary comparing analytical results is included in ***Table 4*** and a tabulated summary comparing field parameter measurements is included in ***Table 5.***

Overall, analytical results for VOCs between ESP and Solutia compared favorably. Especially for those constituents that yielded actual results. However, there were several constituents especially in monitoring wells **REC-1, REC-4,** and **LPZ-5**, where the laboratory detection limit were well above regulatory levels. Every effort should be made by the analytical laboratory to obtain laboratory detection limits that are at or below the regulatory levels.

ESP also obtained field measurements for physical parameters of pH, specific conductivity, and temperature. Comparison of field parameters shows close agreement between ESP and Solutia.

5.6 ANNUAL GROUNDWATER MONITORING REPORT CONTENT

All RCRA regulated TSD Facilities are required by 40 CFR 265.94(b)(2) to submit an Annual Groundwater Monitoring Report by March 1 of the following year. The purpose of the Annual Groundwater Monitoring Report is to document the sampling results and activities, operation and maintenance of the groundwater monitoring system, and the adequacy of the monitoring system at the facility for the year. The GWU reviews the Annual Report from a technical and regulatory standpoint. A copy of the Annual Report Review Worksheet used by MDNR is included in ***Appendix G.*** Solutia should review this worksheet for specific requirements concerning drafting their annual report.

6.0 REFERENCES

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TABLES

TABLE 1
STRATIGRAPHIC COLUMN
SOLUIA, INC., JOHN F. QUEENY PLANT
ST. LOUIS, MISSOURI

Stratigraphic Unit	Thickness (feet)	Depth Below Ground Surface (feet)	Depth to/below Mean Sea Level (feet)
Alluvium	60	0 – 60	420 – 360
St. Louis Limestone	90	60 – 150	360 – 270
Salem Formation	140	150 – 290	270 – 130
Warsaw Formation	110	290 – 400	130 – 20
Burlington-Keokuk Limestone Undifferentiated	155	400 – 555	20 – (-135)
Fern Glen Formation	60	555 – 615	(-135) – (-290)
Chouteau Group	50	615 – 655	(-290) – (-340)
Grassy Creek Shale	20	655 – 675	(-340) – (-360)
Silurian Limestone	120	675 – 795	(-360) – (-480)
Maquoketa Shale	140	795 – 935	(-480) – (-620)
Ordovician System Carbonates and Sandstone	1470	935 – 2405	(-620) – (-2090)
Cambrian System Carbonates and Sandstone	1390	2405 – 3795	(-2090) – (-3480)

Note: The stratigraphy from the surface to 795 feet below the surface was derived from the interpretation of data collected from a well located in NW ¼, NW ¼ Section 26, Township 45 N, Range 7 E. (Missouri well log #3089). The stratigraphy from 795 feet to 3795 feet below ground surface was interpreted from data collected from a well located in SW ¼, SE ¼, SW ¼, Section 30, Township 45 N. Range 7 E. (Missouri well log #2460)

TABLE 2
WATER LEVEL MEASUREMENT COMPARISON BETWEEN THE DEPARTMENT OF NATURAL RESOURCES AND SOLUTIA INC., JOHN F. QUEENY PLANT ST. LOUIS, MISSOURI

	DEPTH TO WATER IN FEET			DEPTH TO WELL BOTTOM IN FEET		
Well Number	DNR	Solutia	Measurement Difference	DNR	Solutia	Measurement Difference
MW-3	12.27	12.27	0.0	30.12	30.27	0.15
REC-1	12.17	12.16	0.01	67.20	67.24	0.04
			0.005			.0.95

TABLE 3
PHYSICAL PROPERTIES OF WATER AT SOLUTIA, INC., JOHN F. QUEENY PLANT ST. LOUIS, MISSOURI COLLECTED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES

Well Number	MW-3	REC-4	REC-1	LPZ-5
Color	Light brown	Clear	Clear	Dark Gray
Oil/Grease	None	None	None	None
Turbidity	Moderate	Low	Low	Low

TABLE 4
SPLIT SAMPLING RESULTS BETWEEN THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AND SOLUTIA, INC., JOHN F. QUEENY PLANT ST. LOUIS, MISSOURI

WELL NUMBER	MW-3		REC-4			REC-1		LPZ-5	
	DNR	Solutia	DNR	Duplicate	Solutia	DNR	Solutia	DNR	Solutia
Arsenic	9.52	NA	4.59	4.45	NA	8.58	NA	165	NA
Lead	23.7	NA	1.54	1.47	NA	17	NA	1.41	NA
Benzene	<0.5	<10	4.88	5.24	<100	<0.50	<100	129	<500
Chlorobenzene	34.3	27	610	542	550	211	<100	7510	9100
1-chlorobutane	<0.5	NA	<0.5	<0.5	NA	<0.5	NA	62.6	NA
4-Chloroaniline	<1.0	NA	1310	948	NA	<0.5	NA	12900	NA
2-chlorophenol	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	79.1	NA
1,1-Dichloroethene	1.16	NA	6.19	6.65	NA	<0.5	NA	<50.0	NA
1,1-Dichloroethane	<0.5	NA	0.95	0.89	NA	<0.5	NA	<50.0	NA
1,2-Dichlorobenzene	0.77	NA	6.14	7.14	NA	31.5	NA	19.7	NA
1,4-Dichlorobenzene	<0.5	NA	3.76	<0.5	NA	1.13	NA	15.1	NA
Cis-1,2-dichloroethene	802	710	1570	1500	1700	49.8	<100	154	<500
Trans –1,2-Dichloroethene	13.2	10	47.1	49.1	<100	0.57	<100	<50	<500
2,4-dichlorophenol	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	6.02	NA
2,4-dinitrophenol	<25.0	NA	<25.0	<25.0	NA	<1.0	NA	53.8	NA
di-n-butyl phthalate	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	11.7	NA
p-isopropyltoluene	<0.5	NA	1.7	1.67	NA	1.49	NA	<50.0	NA
2-methylphenol	<1.0	NA	<1	<1.0	NA	<1.0	NA	92.4	NA
4-methylphenol	<5.0	NA	<5.0	<5.0	NA	<1.0	NA	109	NA
Phenol	<1.0	NA	<1.0	<1.0	NA	<1.0	NA	253	NA
Tetrachloroethene	838	530	3050	2880	2700	5710	6400	394	<500
Toluene	0.73	<10	3.3	3.29	<100	1.87	<100	32900	57000
Trichloroethene	326	200	5810	5670	5800	298	140	181	<500
1,2,4-Trimethylbenzene	<0.5	NA	0.56	0.51	NA	<2.5	NA	<50.0	NA
Vinyl Chloride	19.2	<10	76.0	75.2	<100	<0.5	<100	<50	<500

Note: Reported in parts per billion (ppb)

NA – Indicates not analyzed, only VOAs were analyzed for in the trip blank

NR – Not Reported (Field measurements were collected but not reported in the RFI Report)

NV – The departments metals values for MW-6 were invalidated because turbidity analysis and visual observation indicate that the total and dissolved sample labels may have been reversed at the time of collection.

TABLE 5
COMPARISON OF FIELD MEASUREMENT RESULTS BETWEEN THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AND SOLUTIA, INC., JOHN F. QUEENY PLANT ST. LOUIS, MISSOURI

Well Number	MW-3		REC-4		REC-1		LPZ-5	
	DNR	Solutia	DNR	Solutia	DNR	Solutia	DNR	Solutia
pH	6.72	6.72	6.5	6.5	7.3	7.32	7.32	7.32
Temperature °C	16.5	16.5	16.4	16.41	15.3	15.26	14.6	14.6
Conductivity (µmhos)	6328	6328	2759	2759	881	881.8	2371	2371
Oxygen-Reduction	102	102	17	17	120	120	178	-178
Dissolved Oxygen	1.46	1.46	0.43	0.43	3.6	3.6	0.73	0.73

APPENDIX A

LOCATION & SITE MAPS

LEGEND

— GENERAL LOCATION OF J.F. QUEENY PLANT

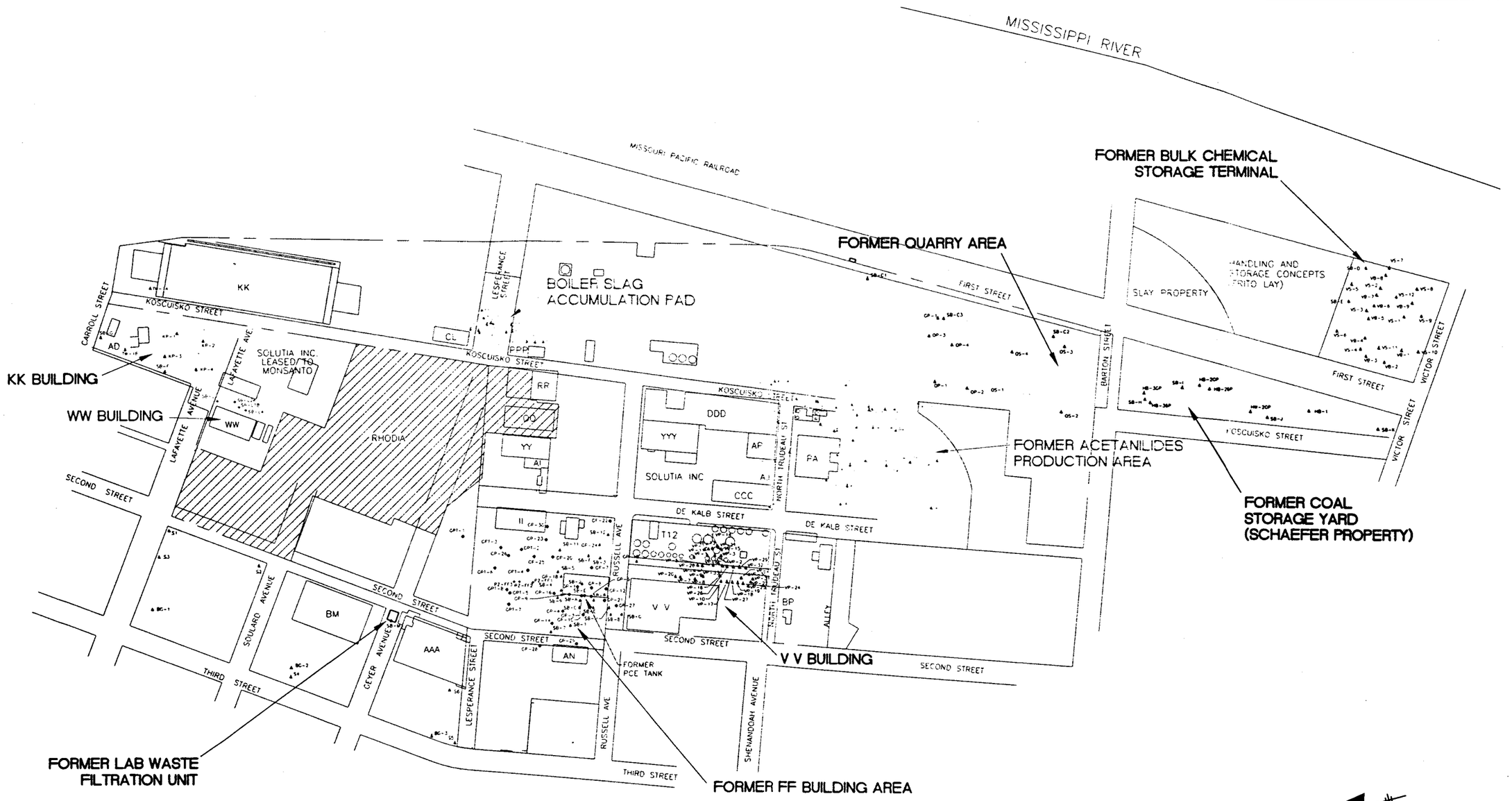
BASE MAP REFERENCE: MAP TAKEN FROM ELECTRONIC USGS DIGITAL RASTER GRAPHIC 7.5 MINUTE SERIES TOPOGRAPHIC MAP OF CAHOKIA, ILLINOIS, REVISED 1952.

N

0 2000

SCALE FEET

SOLUTIA INC. RFI DATA GAP INVESTIGATION J.F. QUEENY PLANT ST. LOUIS, MISSOURI	PROJECT NO. 2320000058.00
URS	
DRN. BY: chs 7/02/01 DSGN. BY: tja CHKD. BY: TJA	Site Location Map
	FIG. NO. 2-1



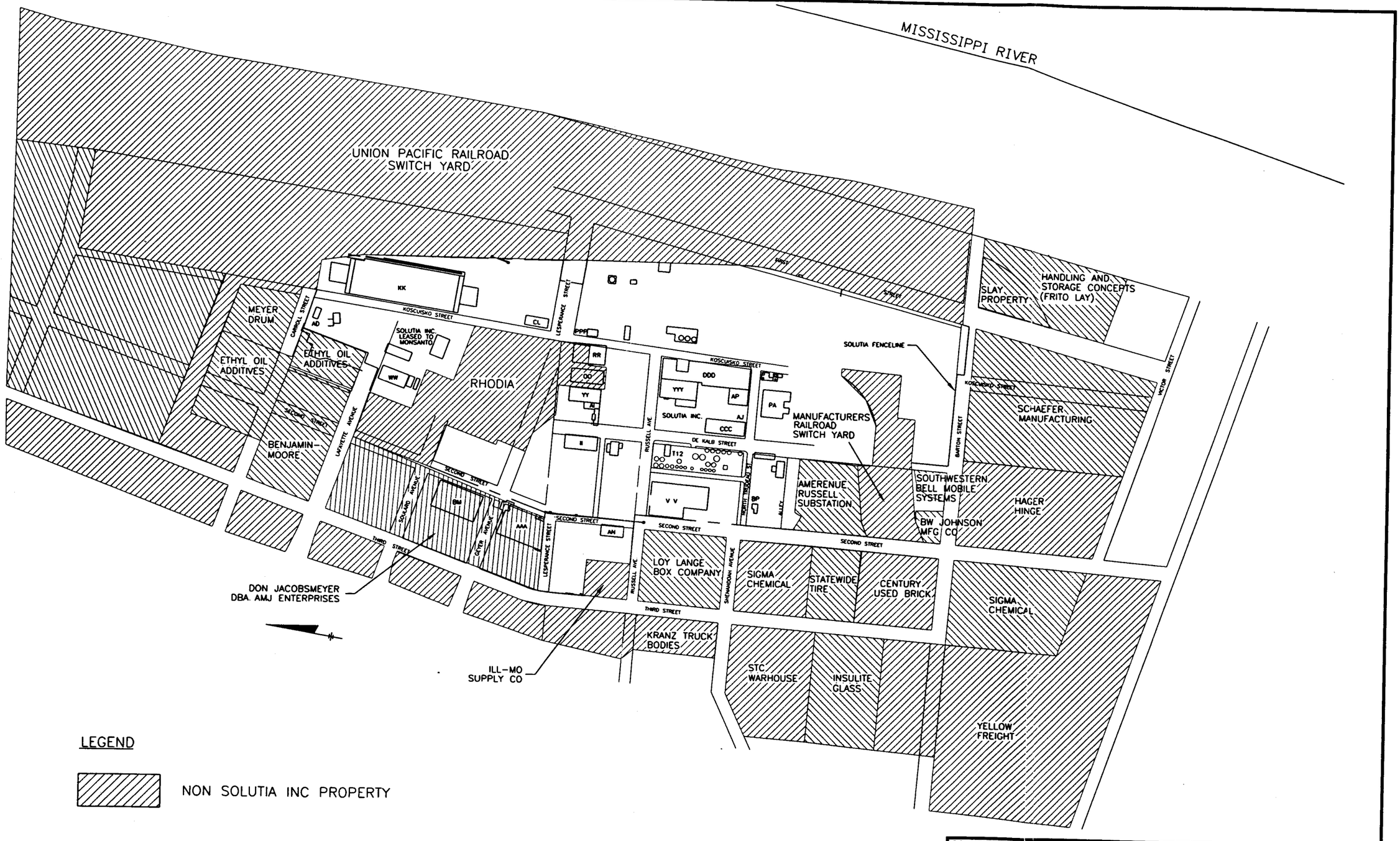
NOTES:

1. SWMUs/AOCs DO NOT HAVE STRICT BOUNDARIES. PLACEMENT OF SAMPLE LOCATIONS IS INTENDED TO ILLUSTRATE THE GENERAL SWMU/AOC AREA.
2. SAMPLING POINTS ON THIS FIGURE REPRESENT VARIOUS DIFFERENT INVESTIGATIONS CONDUCTED TO DATE AT THE FACILITY.
3. REFER TO INDIVIDUAL SWMU/AOC MAPS FOR GREATER DETAIL.
4. LOCATION OF THE MISSISSIPPI RIVER IS APPROXIMATE.

REFERENCE:
RCRA FACILITY INVESTIGATION DATA GAP WORK PLAN JOHN F. QUEENY PLANT BY O'BRIEN & GERE ENGINEERS, INC., SEPTEMBER 1999

SOLUTIA INC. RFI DATA GAP INVESTIGATION J. F. QUEENY PLANT ST. LOUIS MISSOURI	PROJECT NO. 2320000058.00
URS	
DRN. BY: chs/djd 6/21/01 DSGN. BY: tja CHKD. BY: JDC	Location of Solid Waste Management Units and Areas of Concern — FIG. NO. 2-4

File: F:\123=2000000058.00\CADD\DRAFT RFI REPORT\050 (SOIL B-GPROB LOCATION).DWG Last edited: SEP. 12, 01 @ 2:07 p.m. URS Corp.



LEGEND

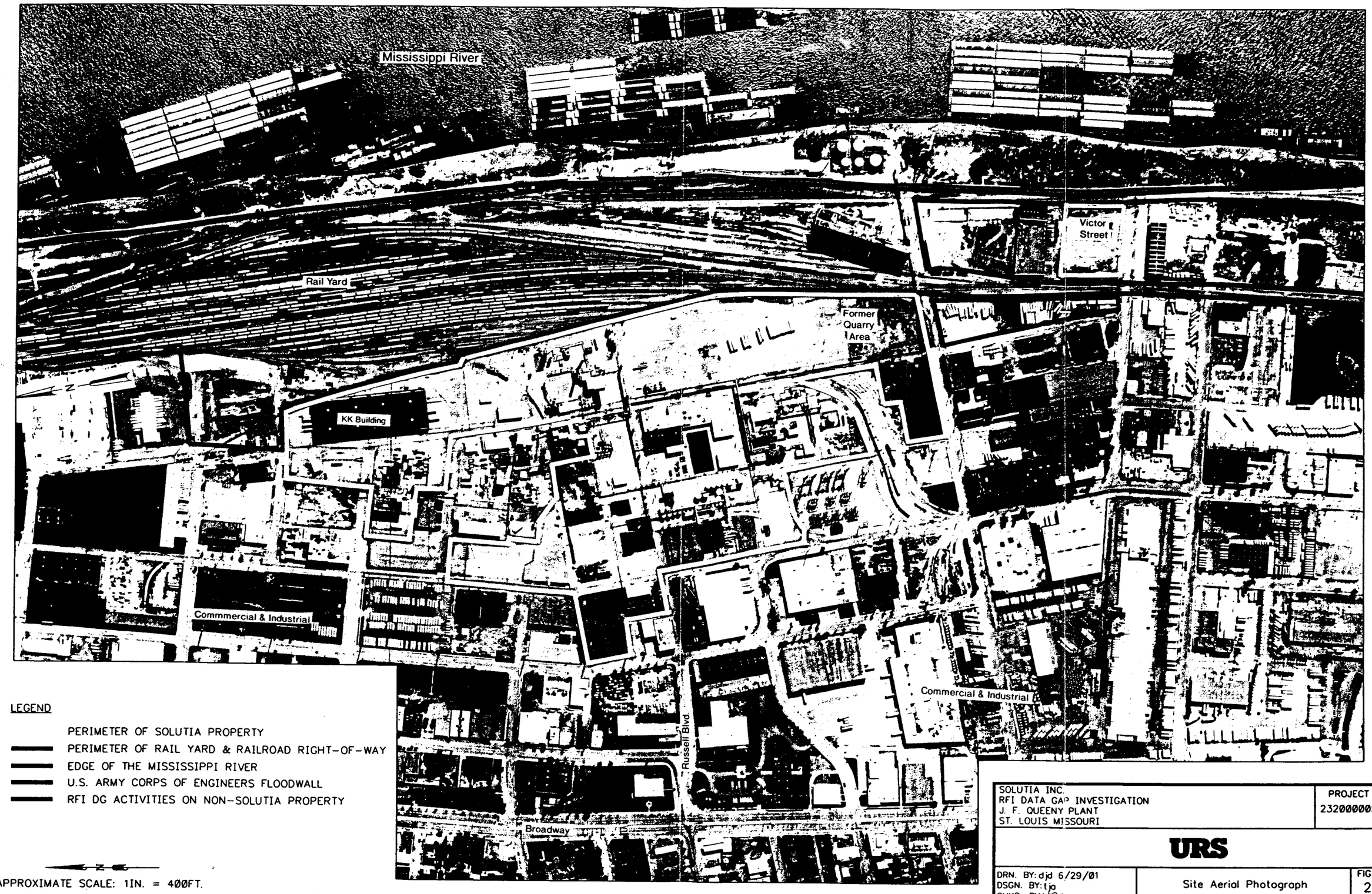
NON SOLUTIA INC PROPERTY

REFERENCE:
RCRA FACILITY INVESTIGATION DATA GAP WORK PLAN JOHN F. QUEENY PLANT BY O'BRIEN & GERE ENGINEERS, INC., SEPTEMBER 1999

SOLUTIA INC. RFI DATA GAP INVESTIGATION J. F. QUEENY PLANT ST. LOUIS MISSOURI	PROJECT NO. 2320000058.00
URS	
DRN. BY: chs/djd 6/21/01 DSGN. BY: tjo CHKD. BY:	Surrounding Property Map
	FIG. NO. 2-3

C:\ADD\DRAFT RFI REPORT\051 (SOLUTIA).DWG Last edited: SEP. 07, 01 @ 0932 a.m. Corp.

File: EA32-20000



LEGEND

- PERIMETER OF SOLUTIA PROPERTY
- PERIMETER OF RAIL YARD & RAILROAD RIGHT-OF-WAY
- EDGE OF THE MISSISSIPPI RIVER
- U.S. ARMY CORPS OF ENGINEERS FLOODWALL
- RFI DG ACTIVITIES ON NON-SOLUTIA PROPERTY

APPROXIMATE SCALE: 1IN. = 400FT.

SOLUTIA INC. RFI DATA GAP INVESTIGATION J. F. QUEENY PLANT ST. LOUIS MISSOURI		PROJECT NO. 2320000058.00
URS		
DRN. BY: djd 6/29/01 DSGN. BY: tja CHKD. BY:	Site Aerial Photograph	FIG. NO. 2-2

File: E:\23-20000058.00\CADD\DRAFT RFI REPORT\AERIAL 1-2.DWG Last edited: SEP. 07, 01 @ 09:44 a.m. by: DJDEGUIO

APPENDIX B

MONITORING WELL CONSTRUCTION DIAGRAMS

KEY TO BORING LOGS

	Graphic Symbol	Description	USC Class.
GRAVEL		GRAVEL with little or no fines	GP or GW
		Silty GRAVEL	GM
		Clayey GRAVEL	GC
SAND		SAND with little or no fines	SP or SW
		Silty SAND	SM
		Clayey SAND	SC
LOW PLASTIC SILTS AND CLAYS		Inorganic low plastic SILT	ML
		Inorganic low plastic CLAY	CL
		Silty	CL
		Sandy	CL
		Gravelly	CL
		Organic low plastic SILT or CLAY	OL
HIGH PLASTIC SILTS AND CLAYS		Inorganic high plastic SILT	MH
		Inorganic high plastic CLAY	CH
		Organic high plastic SILT or CLAY	OH
		Peat and other highly organic soils	PT
ROCKS		LIMESTONE	
		SHALE	
		SANDSTONE	
		SILTSTONE	
SURFACE MATERIALS		Topsoil or pavement	
		FILL	

TERMS DESCRIBING CONSISTENCY OR CONDITION

Coarse grained soils (major portion retained on No. 200 sieve): Includes gravels and sands. Condition is rated according to the Standard Penetration Resistance, as shown below.

Descriptive Term	Blows per Foot
Very loose	0 - 5
Loose	5 - 10
Medium dense	10 - 30
Dense	30 - 50
Very dense	Greater than 50

Fine grained soils (major portion passing No. 200 sieve): Includes clays and silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings or by unconfined compression tests.

Descriptive Term	Unconfined Compressive Strength, tons/sq.ft	Hand Test
Very soft	less than 0.25	Extrudes between fingers
Soft	0.25 - 0.50	Molded by slight pressure
Firm	0.50 - 1.00	Molded by strong pressure
Stiff	1.00 - 2.00	Indented by thumb
Very stiff	2.00 - 4.00	Indented by thumbnail
Hard	4.00 and higher	Difficult to indent

LEGEND AND NOMENCLATURE

	Standard Penetration Sample
	Liner-tube sample, obtained by penetration of thick wall sampler containing 2 in. diameter liner-tubes (California sampler).
	Undisturbed sample, obtained by penetration of minimal 3 in. diameter, thin wall tube or, where indicated, fixed-piston sampling head.
	NX core.
PP,tsf	Unconfined compressive strength in tsf estimated with pocket penetrometer.
TV,tsf	Undrained shear strength in tsf estimated with torvane.
NMC,%	Natural Moisture Content, %
LL	Liquid Limit
PI	Plasticity Index
Qu, ksf	Unconfined Compressive Strength (Laboratory), ksf
RQD=80%	Percentage (80) of Rock Quality Designation
	Depth Groundwater enters at time of drilling.
	Groundwater Level at some specified time after drilling.

SAMPLING RESISTANCE

P	Sample pushed by hydraulic rig action.
3 6 9	Numbers indicate blows per 6 in. of sampler penetration when driven by a 140 lb hammer falling freely 30 in. The Standard Penetration Resistance is the number of blows for the last 12 in. of penetration of the Standard Penetration sampler, e.g. 15.
15	Standard Penetration Resistance
50/2	Number of blows (50) used to drive the Standard Penetration Sampler a certain number of inches (2).

ABBREVIATIONS USED UNDER "FIELD NOTES"

HSA = Hollow Stem Auger
CFA = Continuous Flight Auger
ATD = At Time of Drilling
AD = After Drilling
DWL = Drill Water Loss
DWR = Drill Water Return

COORDINATES FOR NEW MONITORING WELLS

Monitoring Well ID	North	East
MW-22	3432.45	5557.98
MW-23	3539.55	6169.04
MW-24A	2028.54	5604.39
MW-24B	2033.32	5598.76
MW-25A	2153.69	5841.21
MW-25B	2150.16	5848.59
MW-26	2957.75	5823.87
MW-27	3992.4	6363.04
MW-28A	4784.86	6587.71
MW-28B	4786.31	6582.72
MW-29	5076.05	6660.42
MW-30A	5558.9	6777.36
MW-30B	5554.03	6777.1

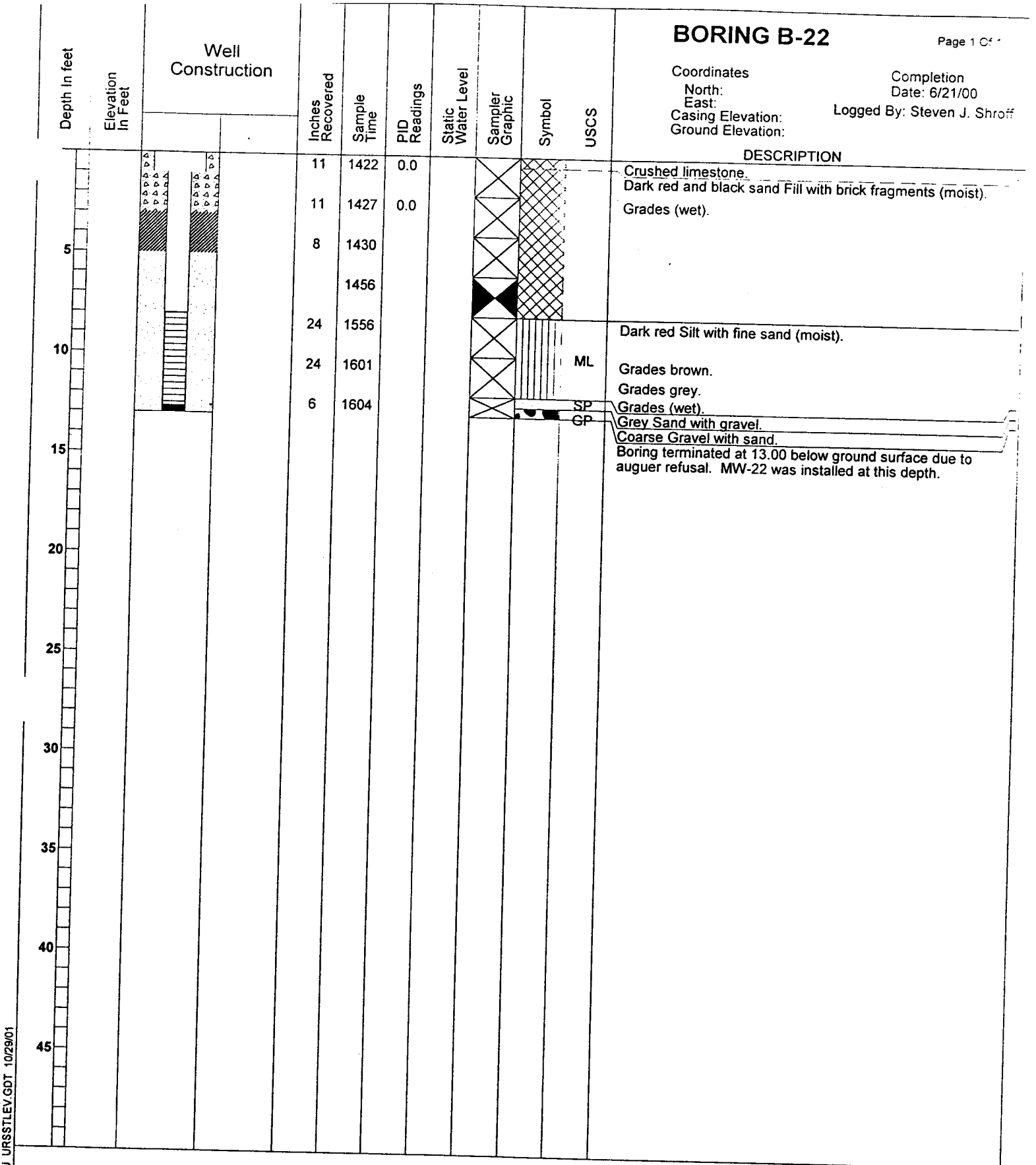
Note: All Coordinates based on Queeny Plant coordinate system.

BORING B-22

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/21/00

Logged By: Steven J. Shroff



Notes:

Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

1STL_SOLUTIA SOLUT.GPJ URSSTLEV.GDT 10/29/01

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 424.04

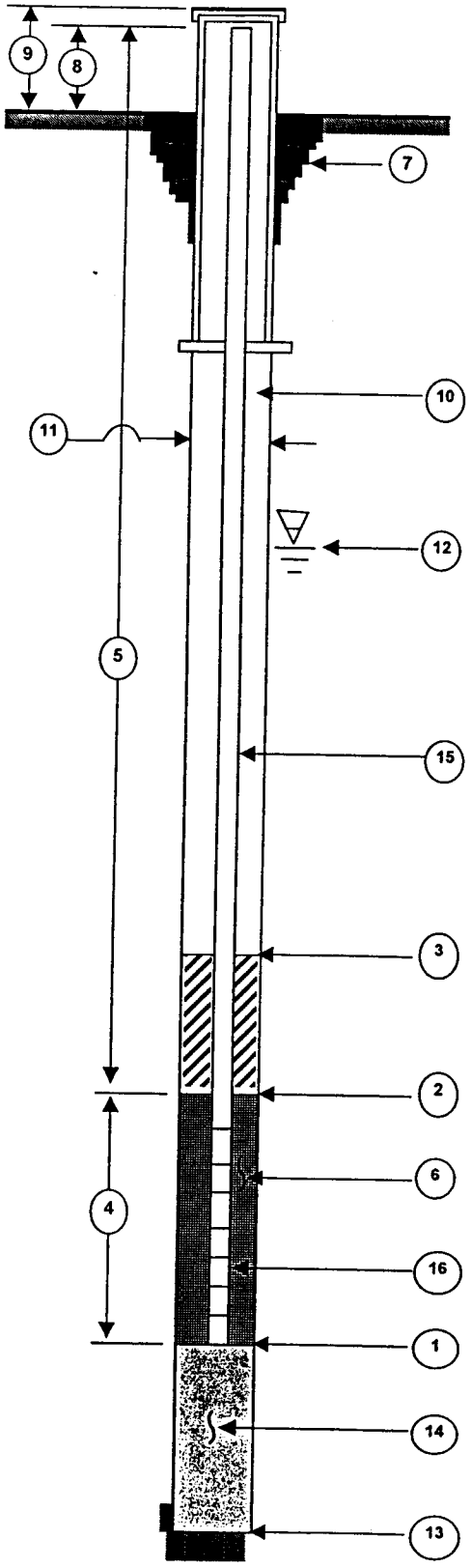
TOP OF INNER WELL CASING ELEVATION 426.70

JOB NUMBER 23-20000058.00

BORING NUMBER MW-22

INSTALLATION DATE 6/23/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 13 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 5 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 3 FEET.*

4 LENGTH OF WELL SCREEN 5 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 10.5 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand.

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.7 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL N/A.

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 13 FEET.*

14 TYPE OF LOWER BACKFILL N/A.

15 PIPE MATERIAL Schedule 40 PVC.

16 SCREEN MATERIAL Schedule 40 PVC.

* (DEPTH FROM GROUND SURFACE)

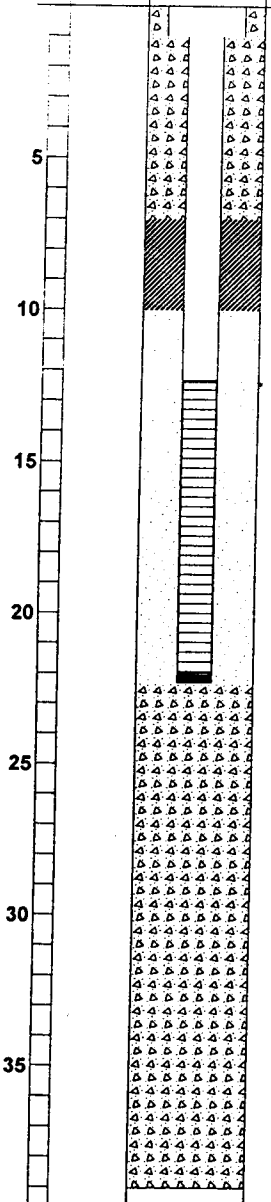
MONITORING WELL INSTALLATION DETAILS

URS Corporation

BORING B-23

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/19/00
Logged By: Steven J. Shroff



Depth In feet	Inches Recovered	Sample Time	PID Readings	USCS	DESCRIPTION
	20	1351	6.9		Crushed limestone.
	18	1354	6.3		Greenish grey to black silty, sandy clay Fill with brick fragments.
	9	1358	13.7		Grey clayey silt with sand (Dry).
5	14	1404	0.0		1-inch black sand seam. Grades with brick fragments.
	17	1406	0.0		Grades with trace gravel (moist).
10	8	1413			Grades black with sand and gravel (very moist).
		1435			Black sand and gravel Fill, trace silt (wet).
15	9	1447	0.0		
	1	1456			Greenish grey silty clay Fill with sand and gravel (moist).
	8	1501			Black sand, gravel and clay Fill (wet).
20		1523			2-inch black silty clay seam (dry).
	14	1534			Grey silty clay with coarse sand (moist) (stiff).
25	10	1540			
	8	1548			
	18	1552			Grades (medium stiff).
30	11	1600		CL	Grades (soft).
	14	1607			Grades with brown (stiff).
	12	1614			
35	10	1619			1-inch brown silt seam.
	12	1624			
40					Weathered Limestone. Boring terminated at 39.0 feet below ground surface due to auger refusal on bedrock. The hole was backfilled with cement/bentonite grout to 22.3 feet below ground surface and MW-23 was installed at that depth.
45					

Notes:
Driller: Roberts Environment
Equipment: CME 75
Method: 4-1/4 & 6-1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

1STL_SOLUTIA2_SOLUT.GPJ URSSTLEV.GDT 10/29/01

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 422.04

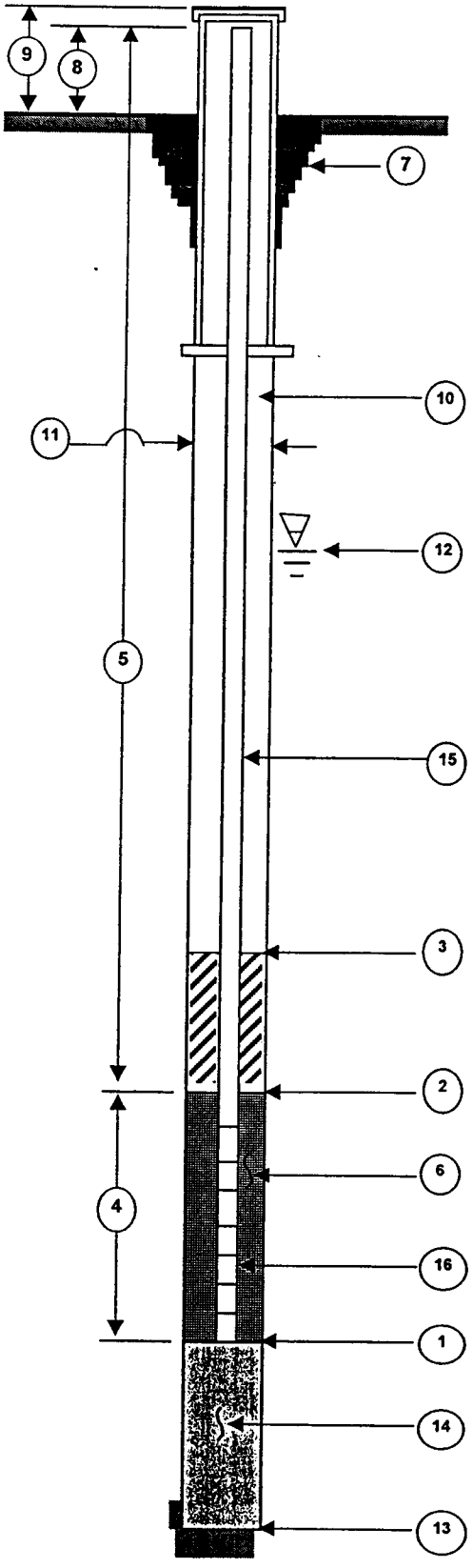
TOP OF INNER WELL CASING ELEVATION 424.29

JOB NUMBER 23-20000058.00

BORING NUMBER MW-23

INSTALLATION DATE 6/22/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 22.3 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 10 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 7 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 14.8 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand .

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.7 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL Cement/Bentonite Grout .

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 39 FEET.*

14 TYPE OF LOWER BACKFILL Cement/Bentonite Grout .

15 PIPE MATERIAL Schedule 40 PVC .

16 SCREEN MATERIAL Schedule 40 PVC .

* (DEPTH FROM GROUND SURFACE)

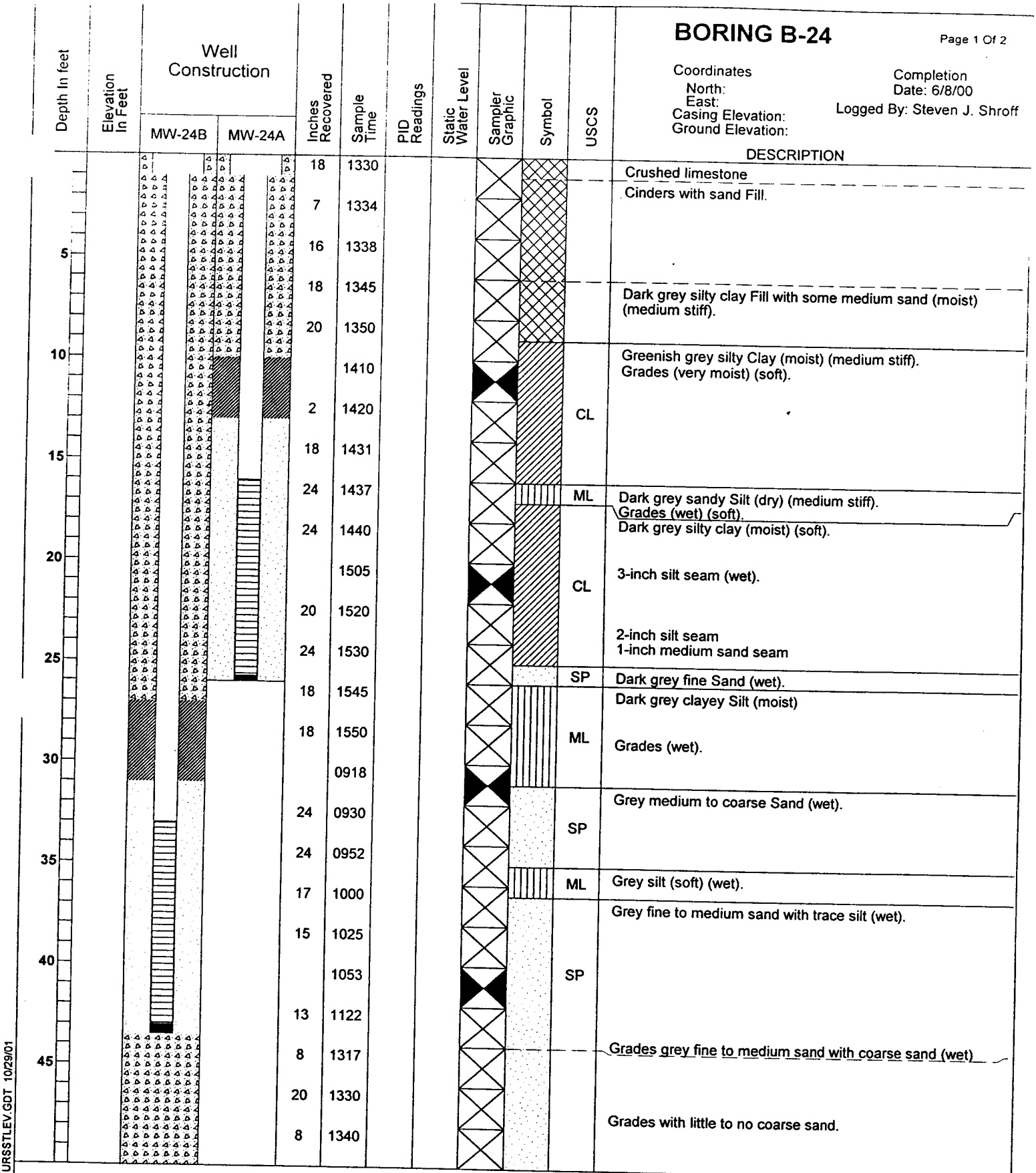
MONITORING WELL INSTALLATION DETAILS

URS Corporation

BORING B-24

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/8/00
Logged By: Steven J. Shroff



Notes:

Driller: Roberts Environment
Equipment: CME 75
Method: 4-1/4 & 6-1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

1STL_SOLUTIA2_SOLUT.GPJ URSSTLEV.GDT 10/29/01

BORING B-24

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/8/00
Logged By: Steven J. Shroff

Depth In feet	Elevation In Feet	Well Construction MW-24B	Well Construction MW-24A	Inches Recovered	Sample Time	PID Readings	Static Water Level	Sampler Graphic	Symbol	USCS	DESCRIPTION
					1420						
				0	1440						Grades with coarse sand and fine gravel.
55				16	1455						
				20	1515						
				14	1530						
60					1610						
				22	0956					SP	
65				24	1010						
				24	1043						
				24	1107						
70					1200						
				0	1337						
75				0							
					1430						
				14							8-inch dark grey Clay seam (moist).
80											Grades with limestone fragments.
											Boring terminated at 82 feet below ground surface due to auger refusal on bedrock. The hole was backfilled with cement/bentonite grout to 43 feet below ground surface and MW-24B was installed at that depth.
85											
90											
95											

Notes:

Driller: Roberts Environment
Equipment: CME 75
Method: 4-1/4 & 6-1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

1STL_SOLUT OLUT.GPJ URSSTLEV.GDT 10/29/01

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 418.34

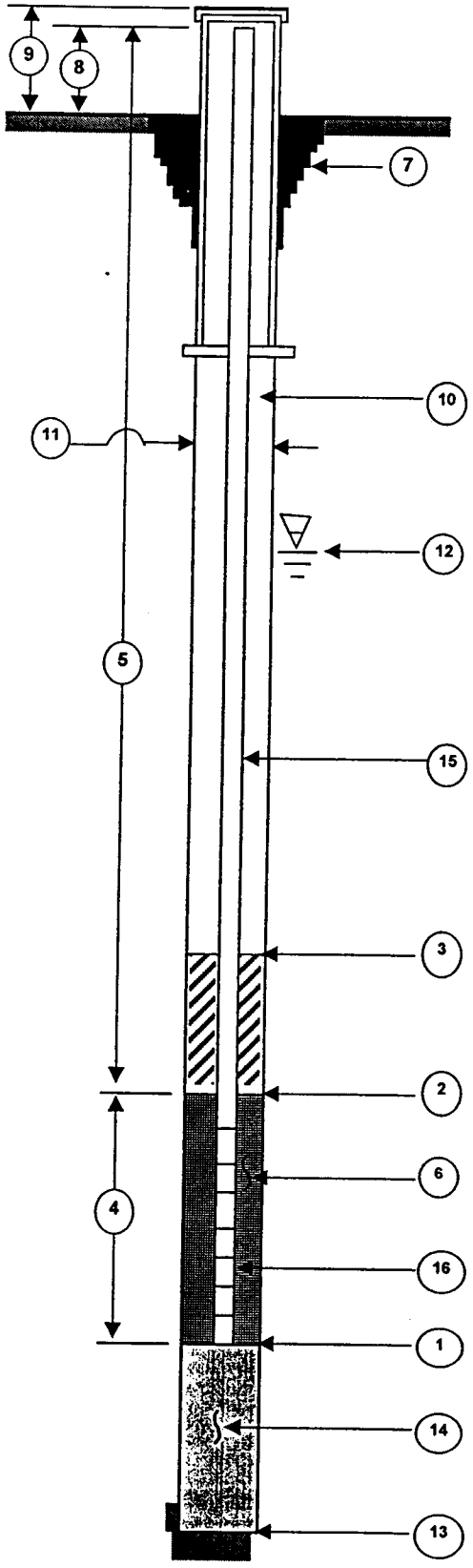
TOP OF INNER WELL CASING ELEVATION 420.80

JOB NUMBER 23-20000058.00

BORING NUMBER MW-24A

INSTALLATION DATE 6/9/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 26 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 13 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 10 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 18.5 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand.

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.7 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL Cement/Bentonite Grout.

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 26 FEET.*

14 TYPE OF LOWER BACKFILL N/A.

15 PIPE MATERIAL Schedule 40 PVC.

16 SCREEN MATERIAL Schedule 40 PVC.

* (DEPTH FROM GROUND SURFACE)

MONITORING WELL INSTALLATION DETAILS

URS Corporation

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 418.44

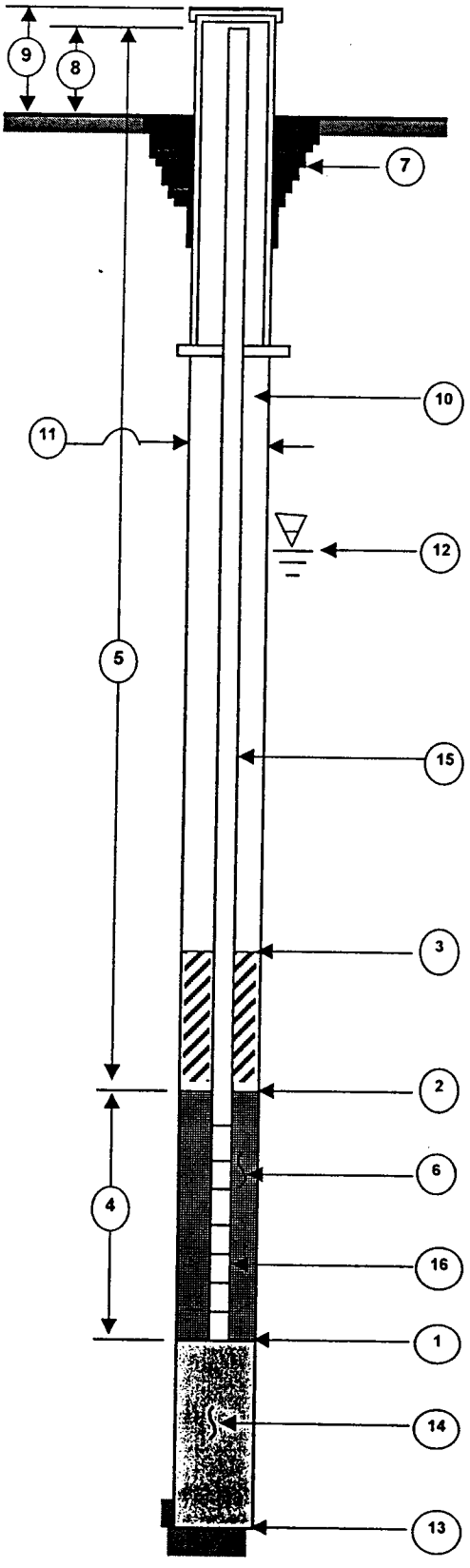
TOP OF INNER WELL CASING ELEVATION 420.84

JOB NUMBER 23-20000058.00

BORING NUMBER MW-24B

INSTALLATION DATE 6/12/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 43 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 31 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 27 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 35 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand .

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.7 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL Cement/Bentonite Grout .

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 82 FEET.*

14 TYPE OF LOWER BACKFILL Cement/Bentonite Grout .

15 PIPE MATERIAL Schedule 40 PVC .

16 SCREEN MATERIAL Schedule 40 PVC .

* (DEPTH FROM GROUND SURFACE)

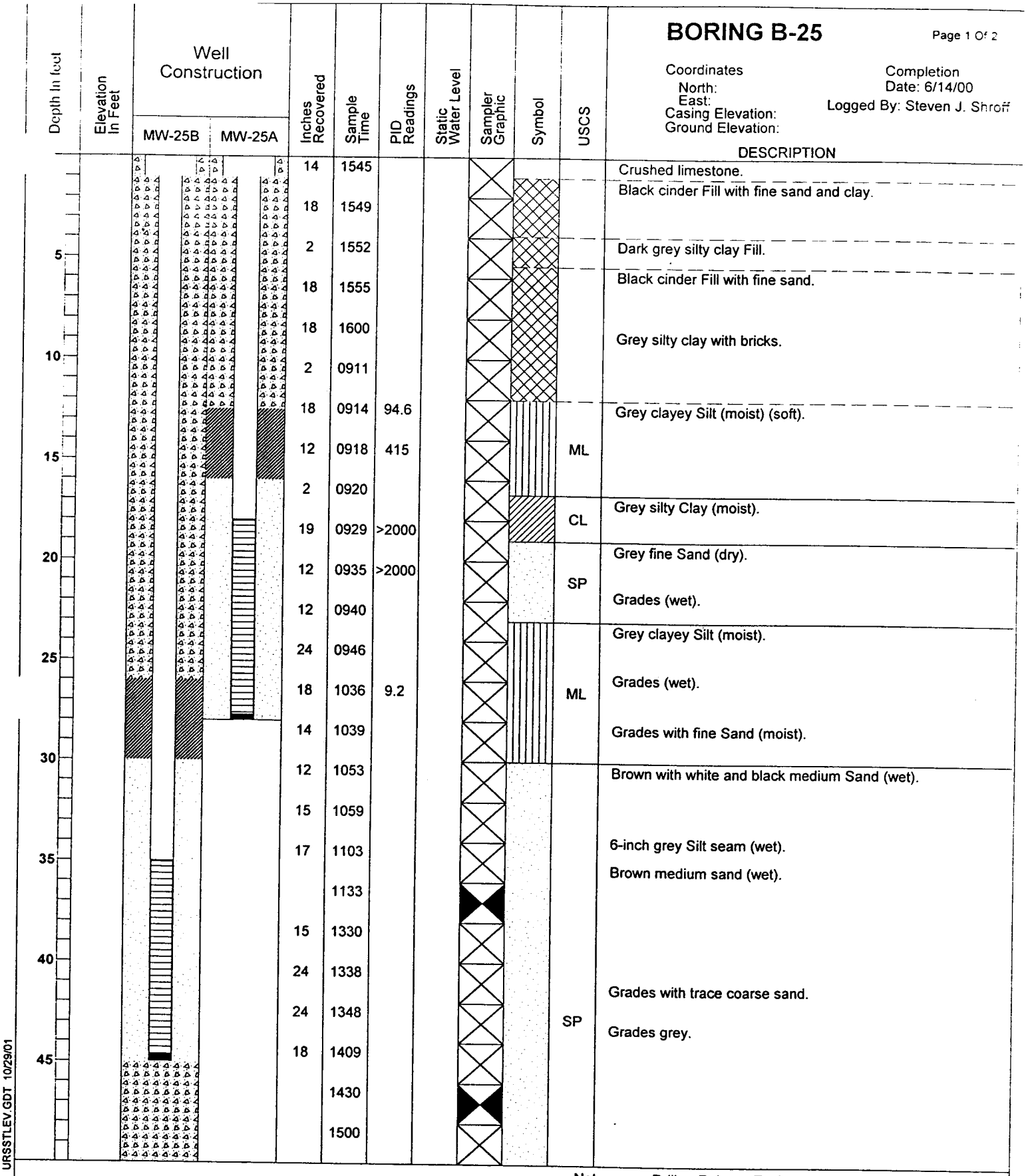
MONITORING WELL INSTALLATION DETAILS

URS Corporation

BORING B-25

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/14/00
Logged By: Steven J. Shroff



Notes:
Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

1STL_SOLUTI ... 'OLUT.GPJ URSSTLEV.GDT 10/29/01

BORING B-25

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/14/00
Logged By: Steven J. Shroff

Depth In feet	Elevation In Feet	Well Construction MW-25B	Well Construction MW-25A	Inches Recovered	Sample Time	PID Readings	Static Water Level	Sampler Graphic	Symbol	USCS	DESCRIPTION
				24	1514						6-inch grey, sandy Silt seam (wet).
				21	1525						
55				24	1540					CL	Grey, silty Clay with fine sand (moist).
					1557						Grey, sandy Silt (wet).
				24	1625						
60				9	0944						
				12	1005						Grades with trace coarse sand.
				0	1023						
65					1045						
				9	1125					SP	
70				8	1340						Grey, fine sand (wet).
				0	1400						
				7	1420						
75					1455						Grey, fine to medium sand (wet).
				24	1600						
80					1615						Grades with gravel.
											Boring terminated at 81.0 feet below ground surface due to auger refusal on bedrock. The hole was backfilled with cement/bentonite grout to 45 feet below ground surface and MW-25B was installed at that depth.
85											
90											
95											

Notes:
Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

1STL_SOLUTIA2_SOLUT.GPJ URSSTLEV.GDT 10/29/01

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 417.14

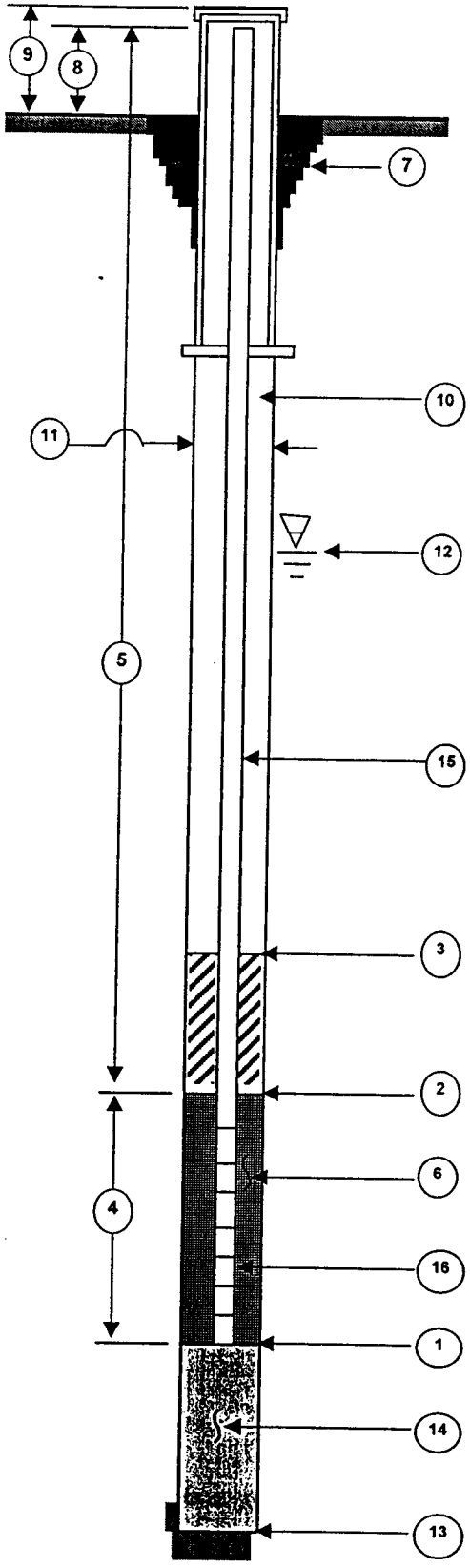
TOP OF INNER WELL CASING ELEVATION 419.90

JOB NUMBER 23-20000058.00

BORING NUMBER MW-25A

INSTALLATION DATE 6/15/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 28 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 16 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 12.5 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 20.5 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand.

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.7 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL Cement/Bentonite Grout.

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 28 FEET.*

14 TYPE OF LOWER BACKFILL N/A.

15 PIPE MATERIAL Schedule 40 PVC.

16 SCREEN MATERIAL Schedule 40 PVC.

* (DEPTH FROM GROUND SURFACE)

MONITORING WELL INSTALLATION DETAILS

URS Corporation

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 417.14

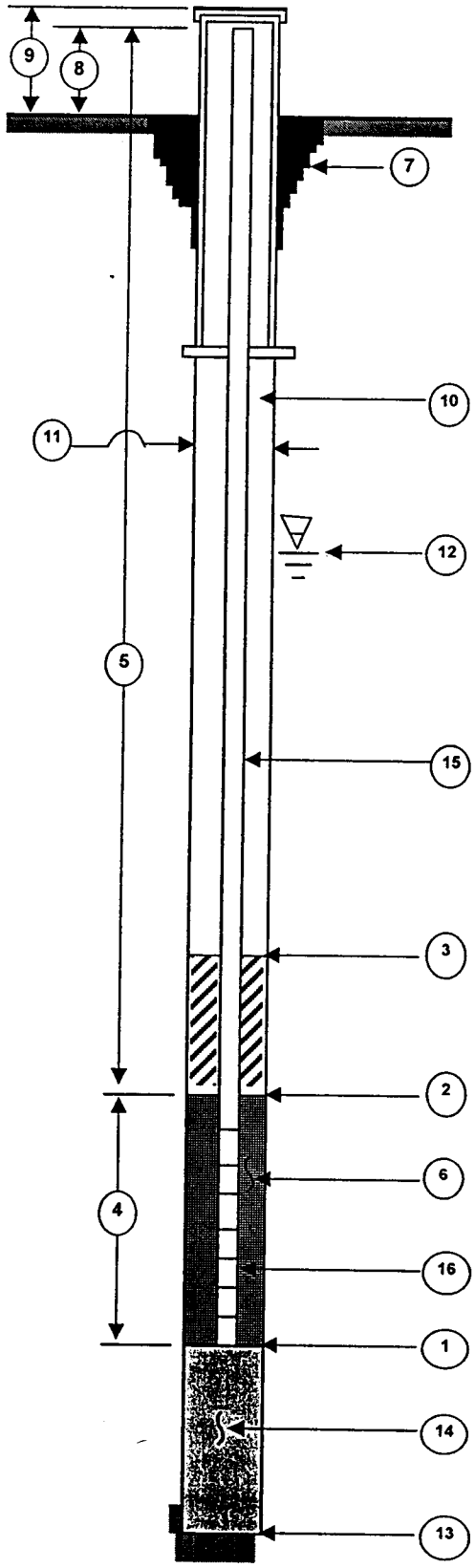
TOP OF INNER WELL CASING ELEVATION 419.99

JOB NUMBER 23-20000058.00

BORING NUMBER MW-25B

INSTALLATION DATE 6/16/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 45 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 30 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 26 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 37.5 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand.

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.7 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL Cement/Bentonite Grout.

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 81 FEET.*

14 TYPE OF LOWER BACKFILL Cement/Bentonite Grout.

15 PIPE MATERIAL Schedule 40 PVC.

16 SCREEN MATERIAL Schedule 40 PVC.

* (DEPTH FROM GROUND SURFACE)

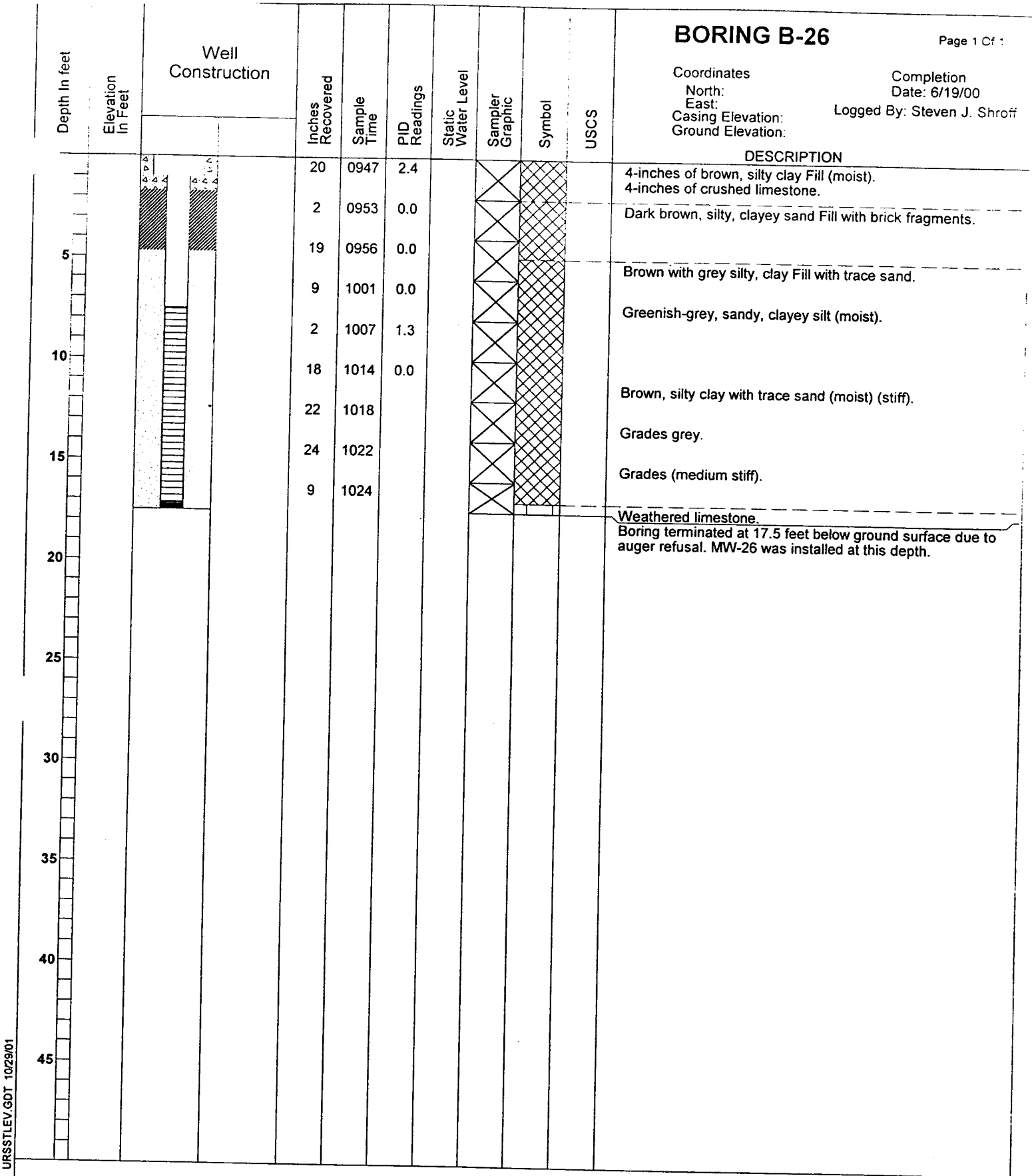
MONITORING WELL INSTALLATION DETAILS

URS Corporation

BORING B-26

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/19/00
Logged By: Steven J. Shroff



Notes:
Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

1STL_SOLUTIA2_SOLUT.GPJ URSSTLEV.GDT 10/29/01

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 423.14

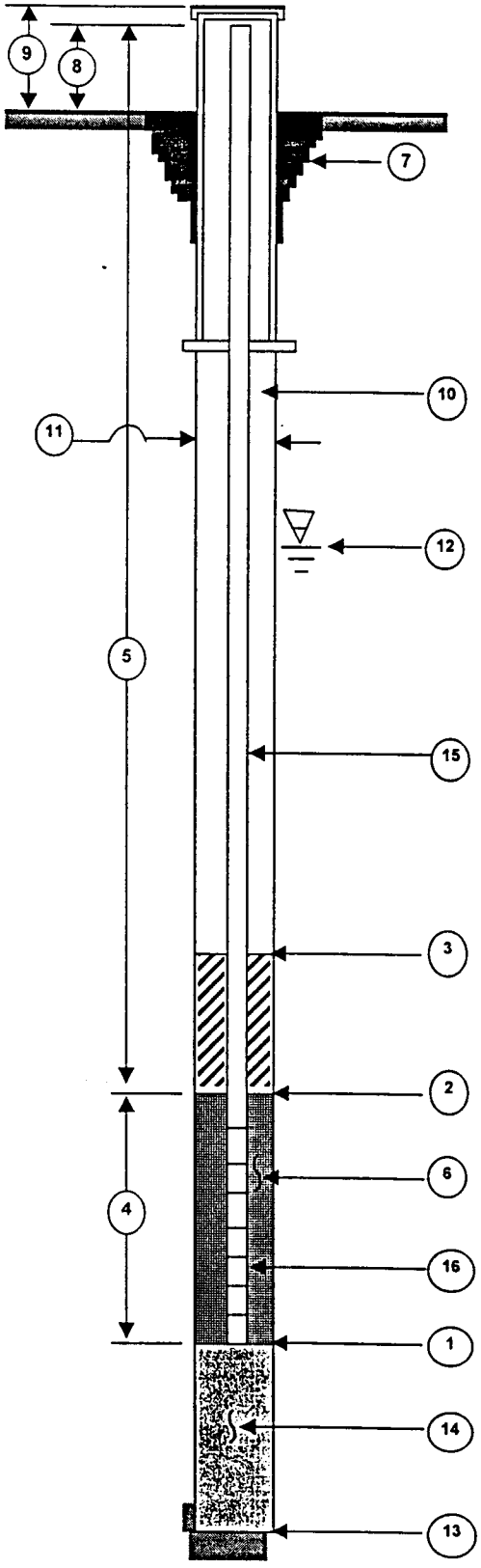
TOP OF INNER WELL CASING ELEVATION 425.78

JOB NUMBER 23-20000058.00

BORING NUMBER MW-26

INSTALLATION DATE 6/20/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 17.5 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 4.7 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 1.7 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 10 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand .

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.3 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.5 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL N/A .

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 17.5 FEET.*

14 TYPE OF LOWER BACKFILL N/A .

15 PIPE MATERIAL Schedule 40 PVC .

16 SCREEN MATERIAL Schedule 40 PVC .

* (DEPTH FROM GROUND SURFACE)

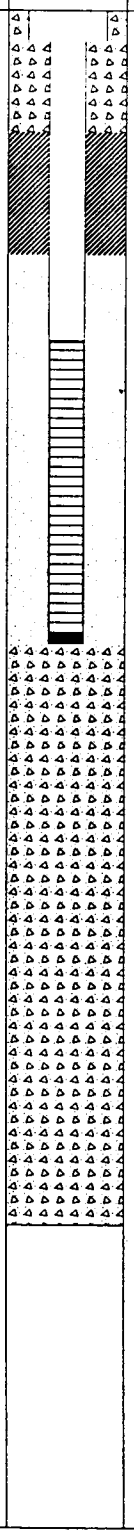
MONITORING WELL INSTALLATION DETAILS

URS Corporation

BORING B-27

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/21/00
Logged By: Steven J. Shroff



Depth In Feet	Elevation In Feet	Inches Recovered	Sample Time	PID Readings	Static Water Level	Sampler Graphic	Symbol	USCS	DESCRIPTION
		20	0846	0.0					Crushed limestone backfill. Black sand and gravel Fill with clay.
		12	0852	0.0					Grades grey, silty clay with brick fragments (moist).
5		14	0856	0.0					Black sand with clay (moist).
		8	0903	0.0					Grades to grey, silty clay with sand.
		16	0907	0.0					Grades (very moist) (soft). Grey with greenish-grey, silty clay Fill with trace brick fragments (moist) (medium stiff).
10		20	0911	0.0					Grades brown. Brown sand and gravel Fill (wet).
		8	0914						Grades grey.
15			0928						Grades brown.
		18	0944						Grey and greenish-grey, silty clay Fill with some fine sand (moist) (medium stiff).
		17	0948						Grey, clayey silt Fill with fine sand.
20		16	0954						Grades brown Grey with greenish-grey, silty clay Fill with trace roots and medium sand (moist) (soft).
		2	0957						Brown Silt with some sand (moist) (soft).
25		20	1003						
		20	1012						
			1050						Grades sandy (wet).
30		16	1102					ML	Grey clayey silt (moist).
		6	1109						
35		18	1115						Grades (wet).
		6	1120						Grades (moist).
		0	1129						Weathered limestone.
40									Boring terminated at 40.0 feet below ground surface due to auger refusal. The hole was backfilled with cement/bentonite grout to 20.8 feet below ground surface and MW-27 was installed at that depth.
45									

Notes:
Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

2 SOLUT.GPJ URSSTLEV.GDT 10/29/01

1STL_S

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 423.14

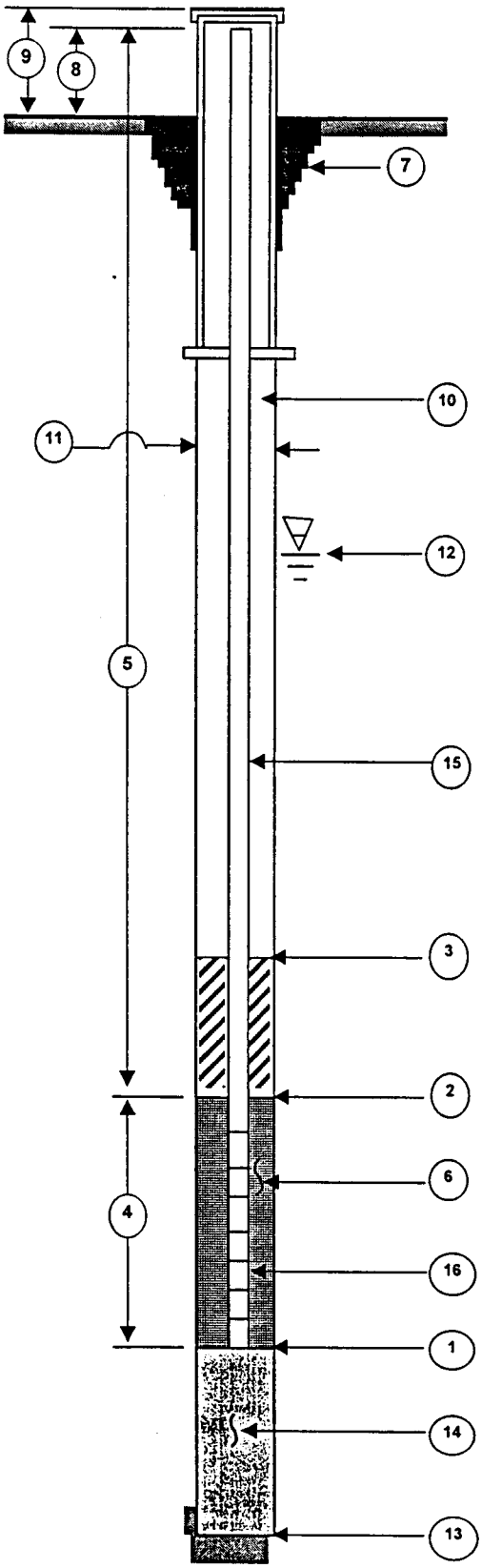
TOP OF INNER WELL CASING ELEVATION 425.99

JOB NUMBER 23-20000058.00

BORING NUMBER MW-27

INSTALLATION DATE 6/23/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 20.8 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 8 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 4 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 13.3 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand .

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.7 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL Cement/Bentonite Grout .

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 40 FEET.*

14 TYPE OF LOWER BACKFILL Cement/Bentonite Grout .

15 PIPE MATERIAL Schedule 40 PVC .

16 SCREEN MATERIAL Schedule 40 PVC .

* (DEPTH FROM GROUND SURFACE)

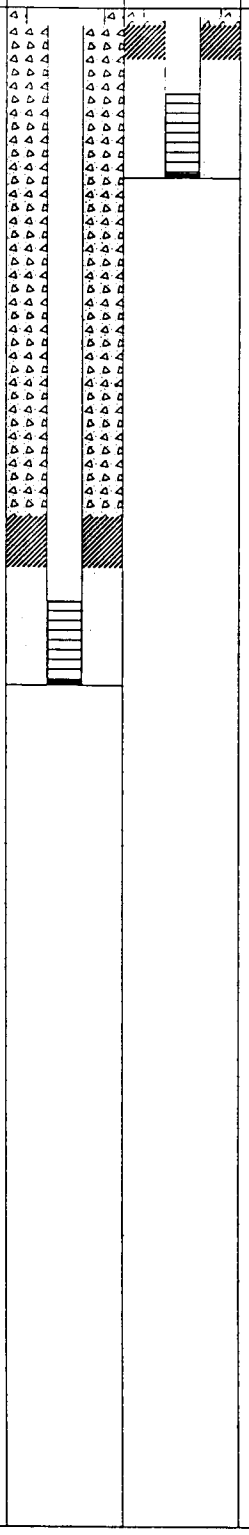
MONITORING WELL INSTALLATION DETAILS

URS Corporation

BORING B-28

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/6/00
Logged By: Steven J. Shroff



Depth In feet	Elevation In Feet	Inches Recovered	Sample Time	PID Readings	Static Water Level	Sampler Graphic	Symbol	USCS	DESCRIPTION
		20	1422	255					Crushed limestone.
		12	1426	215					Black to brown sand and clay Fill (dry).
5		4	1430						Black sand and gravel.
		6	1433						Grades (wet).
		0	1436	1.4					Brown and dark grey, silty, clay Fill with brick and gravel fragments (moist).
10		6	1440						Grades grey, clayey silt (moist).
		10	1503						Grey, silty clay Fill with gravel (moist).
		18	1506						Grades brown.
15		24	1509						Grades with greenish-grey.
		24	1514						Trace brick fragments.
		24							
20		20	1519						
		16	1523						
25		24	1525					ML	Black, clayey silt with fine sand.
		12	1530						Brown, clayey Silt with fine sand (moist).
30		24	1540					SP	4-inch layer brown, fine Sand with silt (moist).
		18	1545						Grades grey.
		20	1547						6-inch fine to medium sand seam (wet).
35		18	1556					CL	Grey, silty Clay with trace fine sand (moist).
		12	1602						
40								SP	Grey Sand.
									Boring terminated at 40.0 feet below ground surface due to auger refusal on bedrock. MW-28B was installed at this depth.
45									
50									
55									
60									
65									
70									
75									
80									
85									

Notes:
Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

SOLUT.GPJ URSSTLEV.GDT 10/29/01

1STL_SI

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 420.04

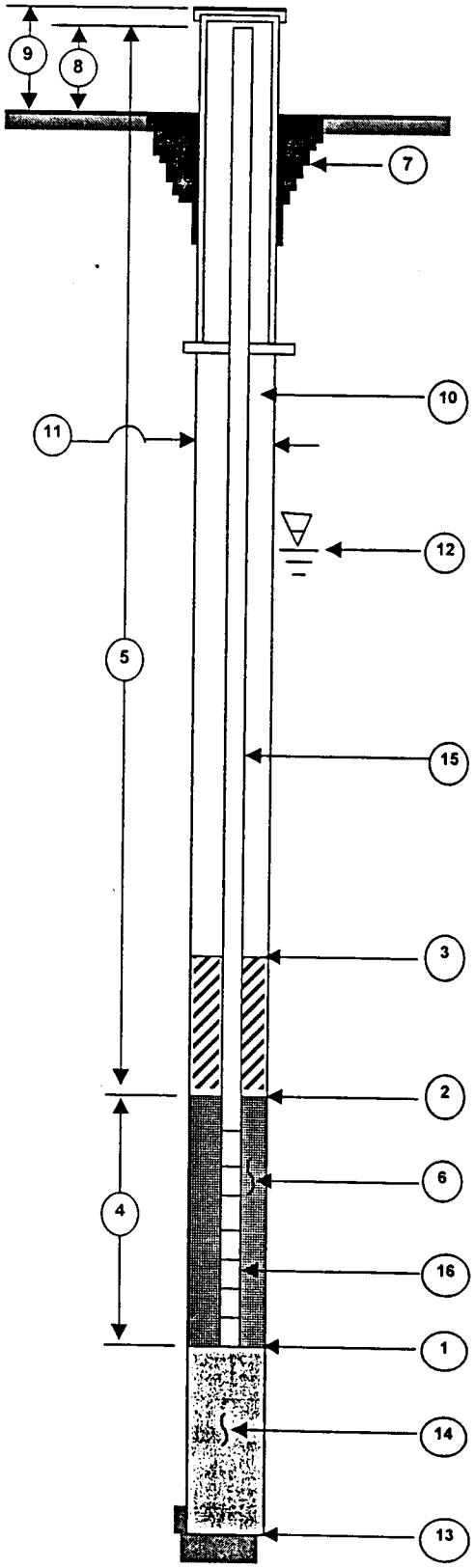
TOP OF INNER WELL CASING ELEVATION 422.64

JOB NUMBER 23-20000058.00

BORING NUMBER MW-28A

INSTALLATION DATE 7/11/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 10 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 3 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 1 FEET.*

4 LENGTH OF WELL SCREEN 5 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 7.5 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand.

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.7 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL N/A.

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 10 FEET.*

14 TYPE OF LOWER BACKFILL N/A.

15 PIPE MATERIAL Schedule 40 PVC.

16 SCREEN MATERIAL Schedule 40 PVC.

* (DEPTH FROM GROUND SURFACE)

MONITORING WELL INSTALLATION DETAILS

URS Corporation

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 420.04

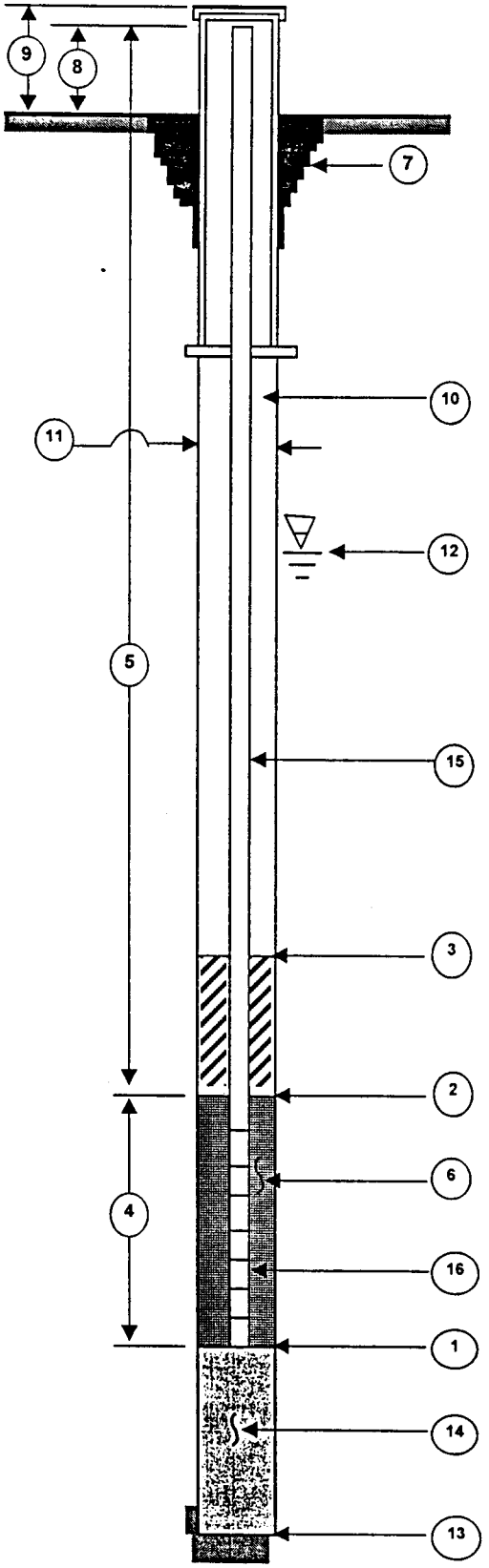
TOP OF INNER WELL CASING ELEVATION 422.86

JOB NUMBER 23-20000058.00

BORING NUMBER MW-28B

INSTALLATION DATE 7/11/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 40 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 33 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 30 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 32.5 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand.

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.3 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.5 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL Cement/Bentonite Grout.

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 40 FEET.*

14 TYPE OF LOWER BACKFILL N/A.

15 PIPE MATERIAL Schedule 40 PVC.

16 SCREEN MATERIAL Schedule 40 PVC.

* (DEPTH FROM GROUND SURFACE)

MONITORING WELL INSTALLATION DETAILS

URS Corporation

BORING B-29

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/28/00
Logged By: Steven J. Shroff

Depth In feet	Elevation In Feet	Well Construction	Inches Recovered	Sample Time	PID Readings	Static Water Level	Sampler Graphic	Symbol	USCS	DESCRIPTION
										Concrete (10") with baserock.
			20		6.9					Black sand and gravel Fill with silt (moist).
5			18	1602	73.9					
			2	1604						
			16	1614	0.0					Dark grey, silty clay with sand and gravel. Greenish-grey, silty clay Fill (moist).
10			12	1618						Black, sandy silt Fill (dry).
			2	1624						Black sand and gravel Fill (wet).
15			6	1626						
			4	1629						Grades with brick fragments.
			4	1633						Greenish-grey, silty clay Fill with trace brick fragments (moist).
20			1	1637						Grades with gravel.
			18	1641						Trace wood fragments.
25			8	1645						6-inch layer of sand and gravel.
			18	1648						Black sand and gravel. Grey, silty Clay (moist).
			0	1654					CL	
30			18	1654						
			6	7000						Grey, medium to coarse Sand (wet).
35			10	1711						
			4	0921						
			24	0930						Grades fine to medium.
40			18	0935					SP	
			18	0959						
			18	1015						
45			10	1025						
			4	1040					ML	Grey Silt with sand (wet).

Notes:
Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

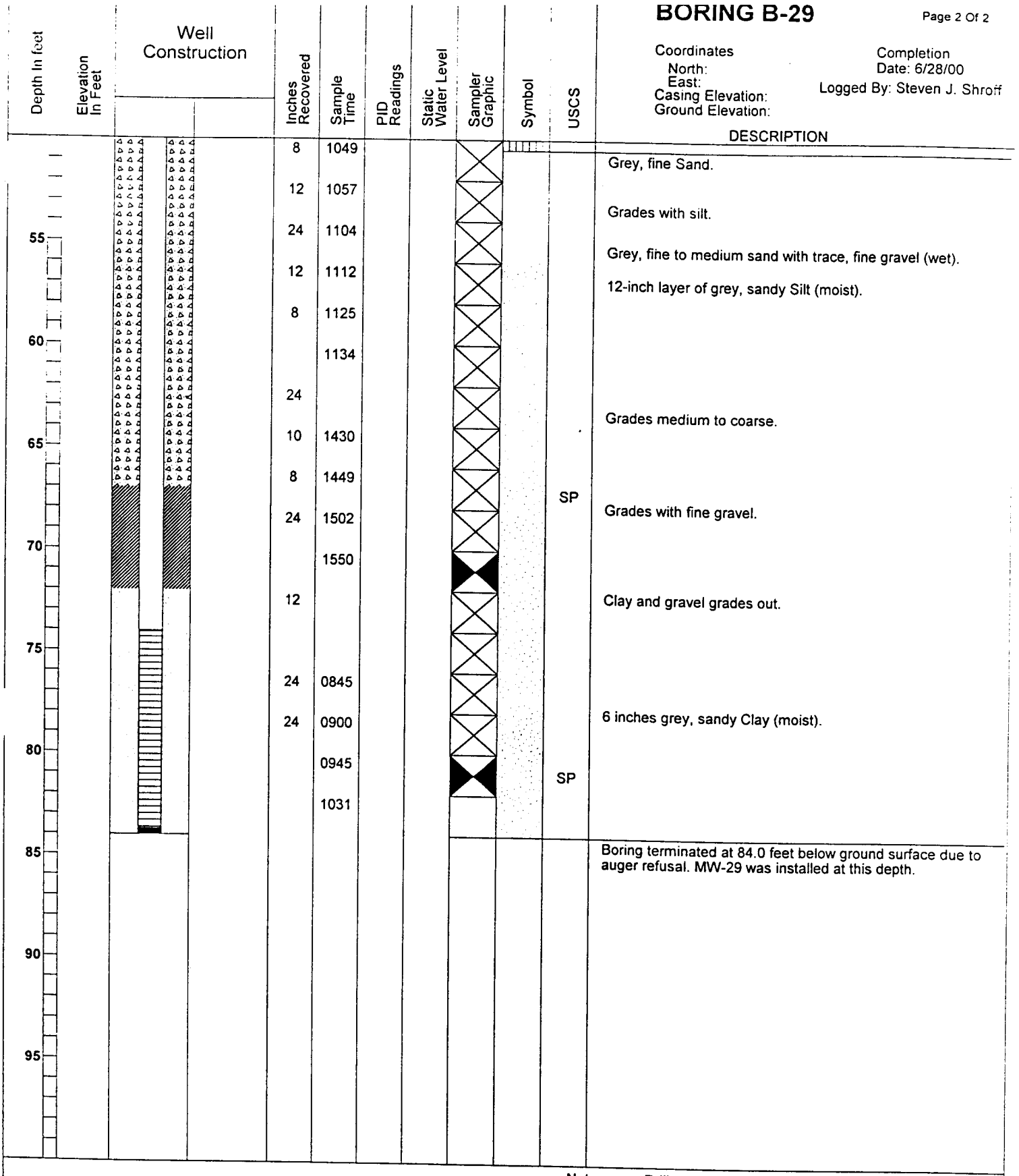
SOLUT.GPJ URSSTLEV.GDT 10/29/01

1STL_S

BORING B-29

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/28/00
Logged By: Steven J. Shroff



Notes:

Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

2_SOLUT.GPJ URSSTLEV.GDT 10/29/01

1STL_S

SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 420.84

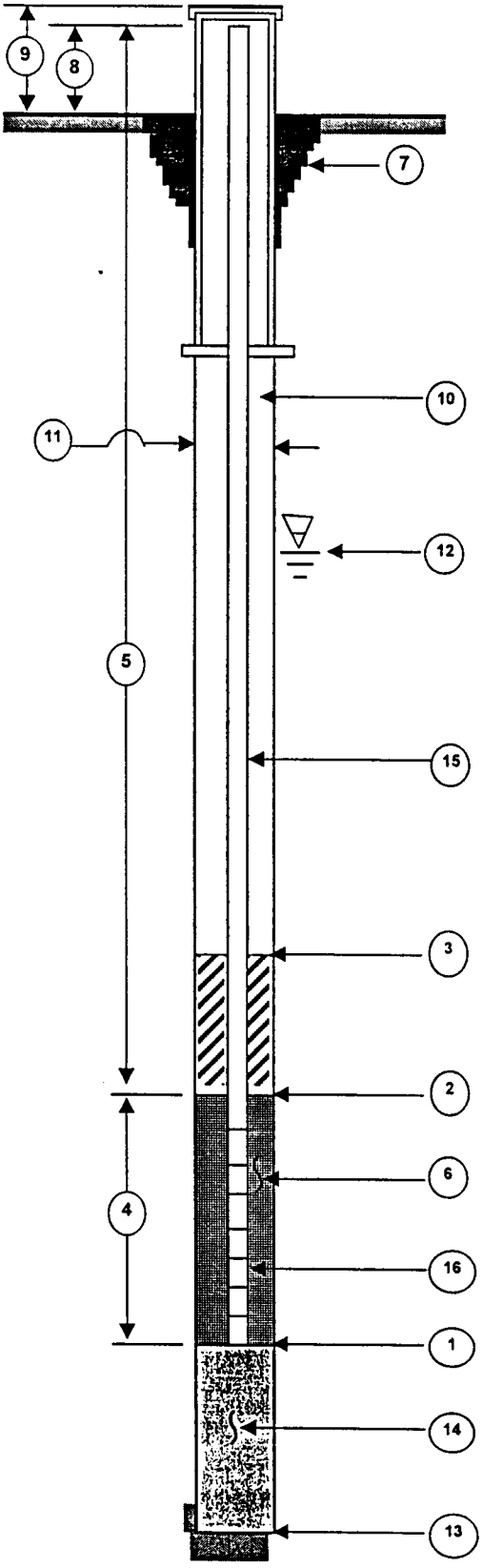
TOP OF INNER WELL CASING ELEVATION 423.45

JOB NUMBER 23-20000058.00

BORING NUMBER MW-29

INSTALLATION DATE 7/10/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 84 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 72 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 67 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 76.5 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand.

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 HEIGHT OF WELL CASING ABOVE GROUND 2.5 FEET.

9 PROTECTIVE CASIING [YES] NO (CIRCLE ONE)
HEIGHT ABOVE GROUND 2.7 FEET.
LOCKING CAP? [YES] NO (CIRCLE ONE)

10 TYPE OF UPPER BACKFILL Cement/Bentonite Grout.

11 BOREHOLE DIAMETER 11 FEET BELOW TOP.

12 DEPTH TO GROUND WATER - FEET.

13 TOTAL DEPTH OF BOREHOLE 84 FEET.*

14 TYPE OF LOWER BACKFILL Cement/Bentonite Grout.

15 PIPE MATERIAL Schedule 40 PVC.

16 SCREEN MATERIAL Schedule 40 PVC.

* (DEPTH FROM GROUND SURFACE)

MONITORING WELL INSTALLATION DETAILS

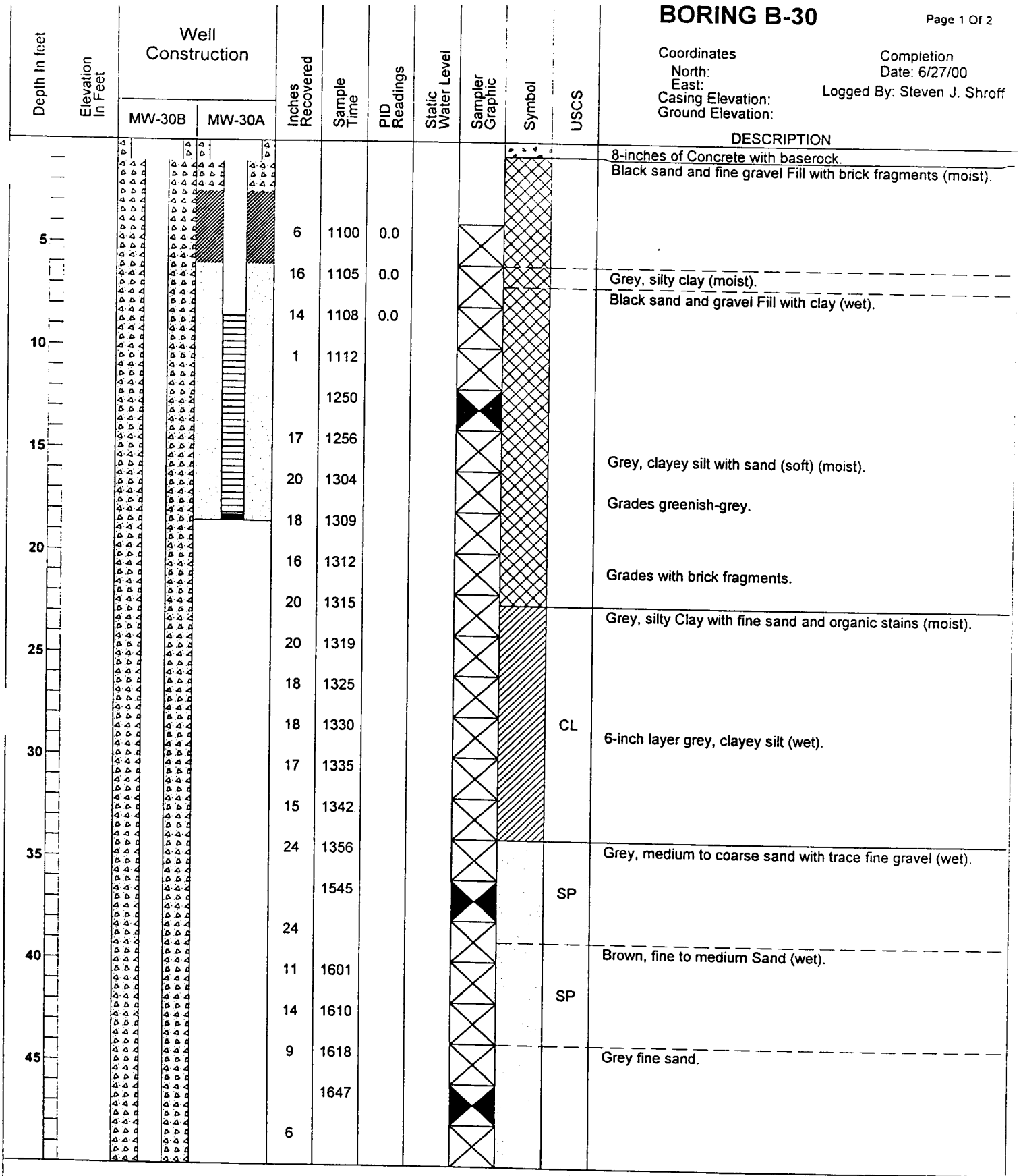
URS Corporation

BORING B-30

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/27/00

Logged By: Steven J. Shroff



Notes:

Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

SOLUT.GPJ URSSTLEV.GDT 10/29/01

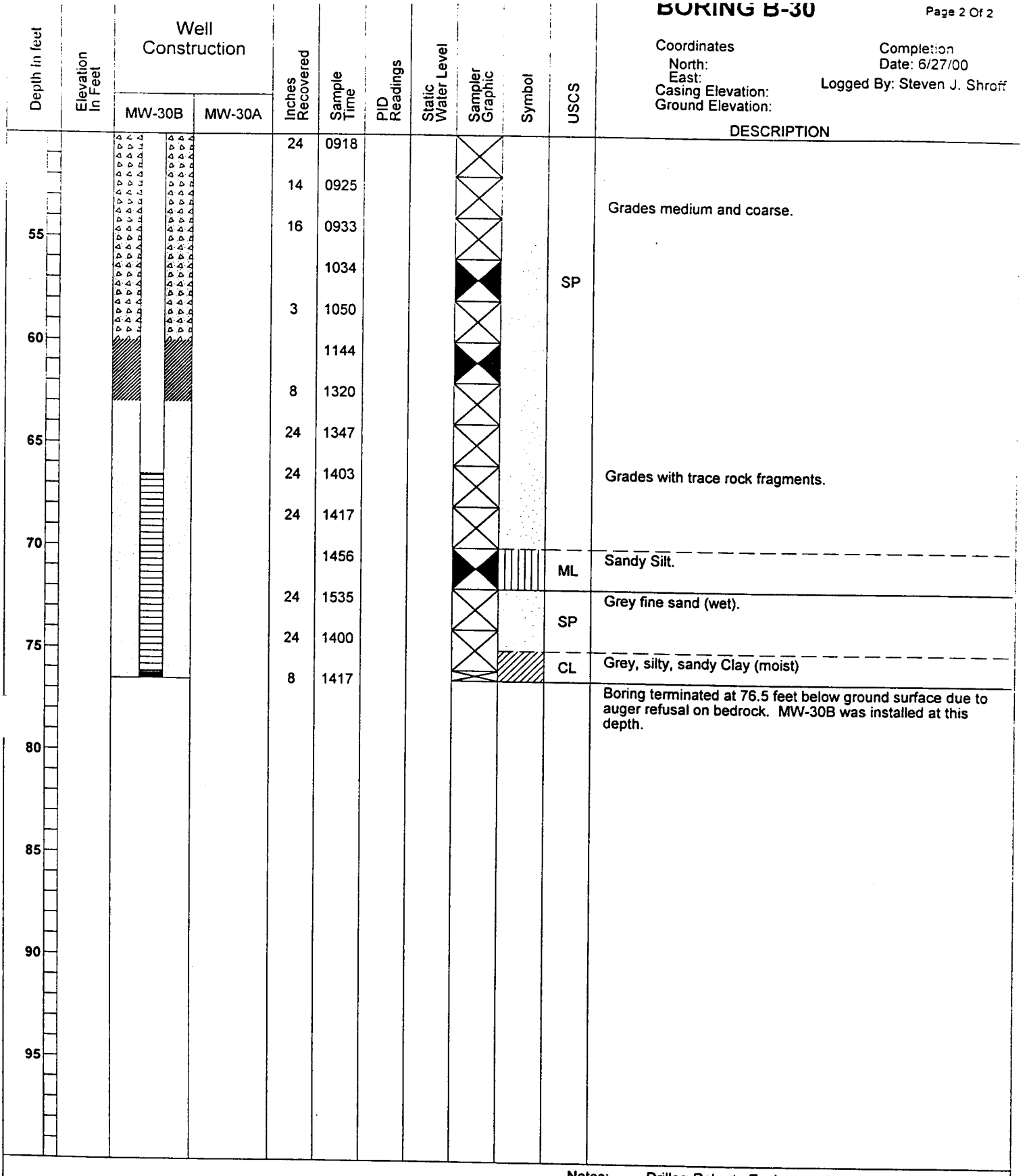
1STL_S

BORING B-30

Coordinates
North:
East:
Casing Elevation:
Ground Elevation:

Completion Date: 6/27/00

Logged By: Steven J. Shroff



Notes:

Driller: Roberts Environment
Equipment: CME 75
Method: 4 1/4 ID HSA
☒ Split Spoon.
☒ Hydropunch.
Unified Soil Classification based on field visual observations

URS

LOG OF BORING AND WELL CONSTRUCTION DETAIL

Solutia - John F. Queeny Plant
Second Street, St. Louis, Missouri

Job No. 23-20000058.00

1STL_4_SOLUT.GPJ URSSTLEV.GDT 10/29/01

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 419.24

TOP OF INNER WELL CASING ELEVATION 418.9

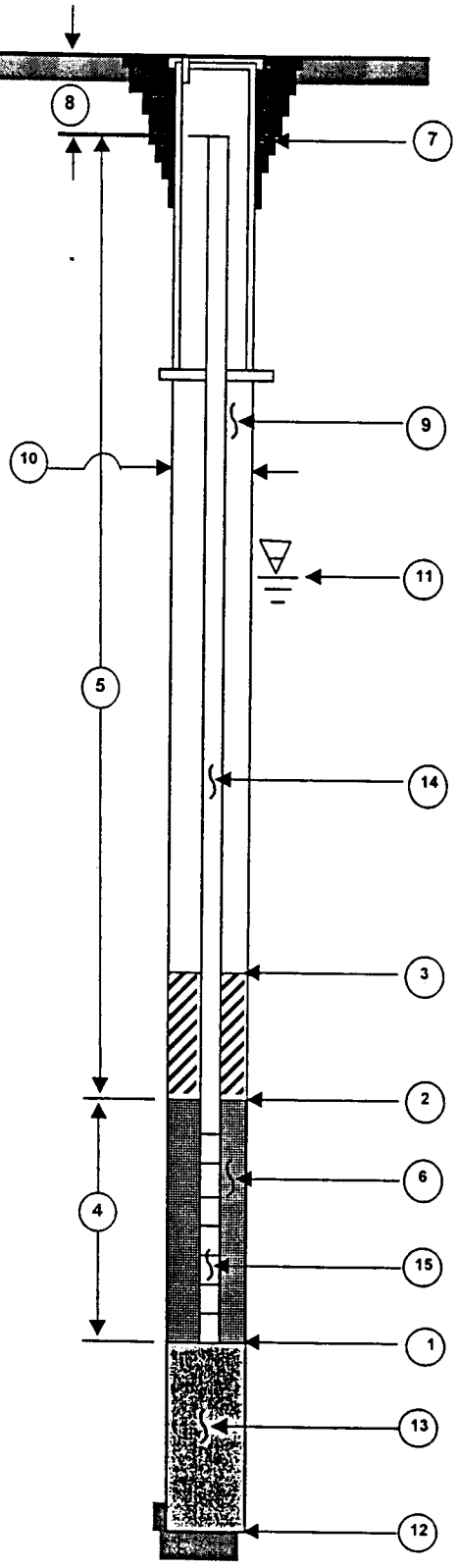
DATUM

JOB NUMBER 23-20000058.00

BORING NUMBER MW-30A

INSTALLATION DATE 6/28/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 18.5 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 6 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 2.5 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 8 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 DEPTH TO TOP OF INNER CASING BELOW GROUND SURFACE 0.5 FEET.

9 TYPE OF UPPER BACKFILL N/A

10 BOREHOLD DIAMETER 11 INCHES.

11 DEPTH TO GROUNDWATER - FEET.

12 TOTAL DEPTH OF BOREHOLE 18.5 FEET.*

13 TYPE OF LOWER BACKFILL N/A

14 PIPE MATERIAL Schedule 40 PVC

15 SCREEN MATERIAL Schedule 40 PVC

* (DEPTH FROM GROUND SURFACE)

MONITOR WELL INSTALLATION DETAILS

URS Corporation

MONITORING WELL INFORMATION SHEET
SOLUTIA - JOHN F. QUEENY PLANT

GROUND SURFACE ELEVATION 419.34

TOP OF INNER WELL CASING ELEVATION 418.89

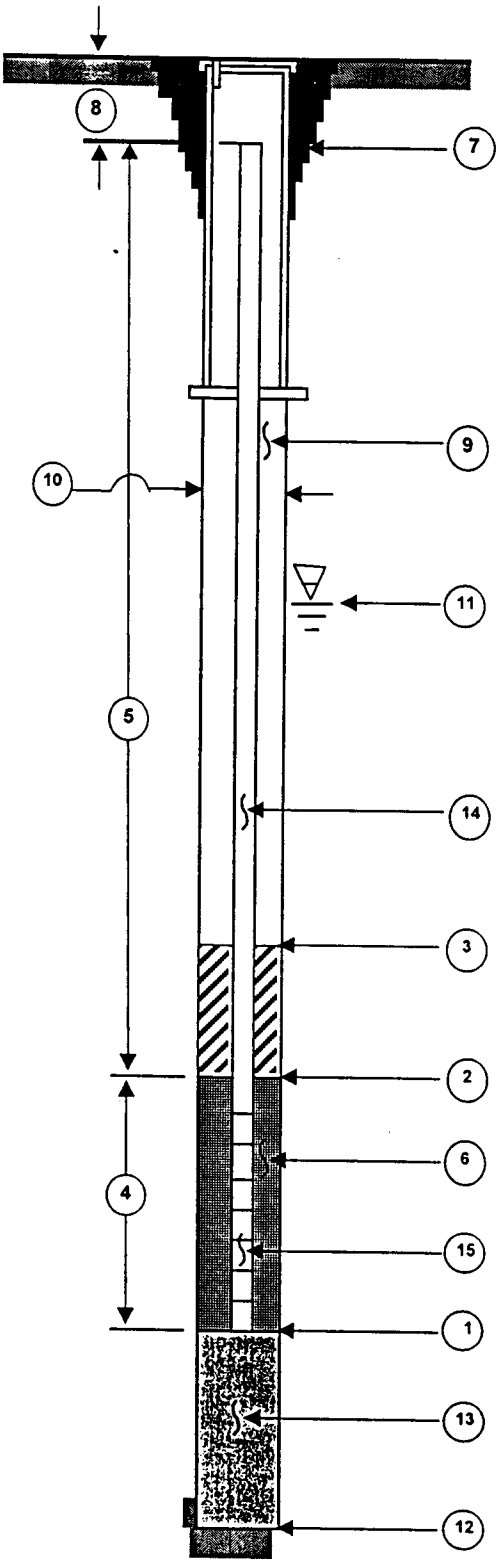
DATUM

JOB NUMBER 23-20000058.00

BORING NUMBER MW-30B

INSTALLATION DATE 7/5/2000

LOCATION St. Louis, Missouri



1 DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 76.5 FEET.*

2 DEPTH TO BOTTOM OF SEAL (IF INSTALLED) 63 FEET.*

3 DEPTH TO TOP OF SEAL (IF INSTALLED) 60 FEET.*

4 LENGTH OF WELL SCREEN 10 FEET.
SLOT SIZE 0.010 INCHES.

5 TOTAL LENGTH OF RISER PIPE 66 FEET AT 4 INCH DIAMETER.

6 TYPE OF PACK AROUND WELL POINT OR SLOTTED PIPE Silica Filter Sand .

7 CONCRETE CAP? [YES] NO (CIRCLE ONE)

8 DEPTH TO TOP OF INNER CASING BELOW GROUND SURFACE 0.5 FEET.

9 TYPE OF UPPER BACKFILL Cement/Bentonite Grout .

10 BOREHOLD DIAMETER 11 INCHES.

11 DEPTH TO GROUNDWATER - FEET.

12 TOTAL DEPTH OF BOREHOLE 76.5 FEET.*

13 TYPE OF LOWER BACKFILL N/A .

14 PIPE MATERIAL Schedule 40 PVC .

15 SCREEN MATERIAL Schedule 40 PVC .

* (DEPTH FROM GROUND SURFACE)

MONITOR WELL INSTALLATION DETAILS

URS Corporation

APPENDIX C

SAMPLING & ANALYSIS PLAN WORKSHEET

GROUNDWATER SAMPLING AND ANALYSIS PLAN (SAP) WORKSHEET
Prepared by
MISSOURI DEPARTMENT OF NATURAL RESOURCES
HAZARDOUS WASTE PROGRAM
GROUNDWATER UNIT

Facility Name and Address: _____
_____
_____

Date of SAP evaluation: _____
Person performing evaluation: _____
Date and Source of SAP evaluated: _____
_____

Y/N/NA

1. **Does the SAP specify that the following field data be measured and recorded (field logbook or sample sheets) during each sampling event:**

a) Water level (each sampling event)? ___
b) Total well depth (at least annually)? ___
c) Weather (temp, general atmospheric conditions)? ___
d) Physical condition of the well? ___
e) Sampling team members? ___
f) Well number, date and time of sampling? ___
g) Physical description of well area? ___
h) Instrument calibration information (before and after)? ___
I) Actual well purge volume and calculations? ___
j) Presence/thickness of any immiscible layers present? ___
k) Any deviation from planned sampling methodology? ___

2. **For well purging does the SAP specify:**

a) Purging technique? ___
b) Type/composition of equipment (manufacture, model)? ___
c) Dedicated equipment? ___
d) Non-dedicated equipment? ___
e) Decontamination procedures for non-dedicated equipment? ___
f) Volume to purge (generic)? ___
g) Method of calculation of purge volume? ___
h) Use of stabilized field parameters (pH, temp, Sp Cond, Eh) to determine when purging is complete? ___
I) Method to prevent purge equipment contact with contaminated surfaces. ___
j) Manner of disposal of purged fluids? ___

Y/N/NA

3. For well sampling does the SAP specify:

a) Sampling technique (gentle bailer lowering, bottom discharge for volatiles, pump rates, etc.)? ___
b) Type/composition of equipment (manufacture, model)? ___
c) Dedicated equipment? ___
d) Non-dedicated equipment? ___
e) Decontamination procedures for non-dedicated equipment? ___
f) Dry well contingency plan for persistently dry wells? ___
g) Sampling protocol for low yield wells? ___
h) Sampling protocol of high yield wells? ___
I) Immiscible phase detection methods? ___
j) Immiscible phase sampling methods? ___
k) Pump and/or bailer intake level (generally)? ___
l) Pump rate (non-volatilization of sensitive parameters)? ___
m) Sampling order according to parameter volatilization potential? ___

4. In relation to the monitored parameters does the SAP specify:

a) Parameters required by regulation (detection)? ___
b) Waste-specific parameters (assessment)? ___

5. In sampling for site-specific parameters does the SAP specify:

a) Specific container/cap type for each parameter? ___
b) Volume of each type of sample container? ___
c) Parameter specific preservative method (chemical and/or cooling)? ___
d) Maximum parameter-specific holding time? ___
e) Sample container labeling requirements? ___
f) Method of packaging & shipment (coolers, blue ice, carrier, etc.)? ___

6. In relation to field and laboratory QA/QC does the SAP specify:

a) General QA/QC procedures? ___
b) The use and frequency of trip blanks (e.g., 1 trip blank per container type)? ___
c) Trip blank preparation protocol? ___
d) The use and frequency of equipment blanks where non-dedicated samplers are used (e.g., one per non-dedicated sampling equip type)? ___
e) Equipment blank preparation protocol? ___
f) The use and frequency of duplicate samples (e.g., 5-10% of total samples)? ___
g) The use and frequency of spiked samples as an indicator of analytical performance or cross-contamination? ___
h) Spike sample preparation protocol? ___

6. (con't): **Y/N/NA**

l) Replicate parameter sampling protocol (e.g., pH, Sp Cond, TOX, TOC)? ___
j) Split/duplicate sampling protocol? ___
k) Calibration frequency for field and laboratory analytical equipment? ___
j) Verification & reporting of analytical data (% recoveries for spiked samples, analytical detection limits, raw analytical data and calculations, etc.)? ___

7. In relation to contaminated equipment does the SAP discuss:

a) Decontamination of field equipment other than that used for purging or sampling (e.g., analytical instrument probes, depth measuring devices, etc.)? ___
b) Decontamination of laboratory equipment (e.g., sample bottles, sample analysis equipment, contaminated sample shipment containers)? ___
c) Disposal of potentially contaminated sampling equipment and clothing (e.g., glassware, plasticware, sample coolers containing broken sample bottles, gloves, coveralls, etc.)? ___

8. Does the SAP discuss sample Chain-of-Custody (COC) including:

a) Field and laboratory COC procedures? ___
b) Disposition of samples? ___
c) COC sample forms? ___

9. Does the SAP include a Health and Safety Plan (HSP) that discusses:

a) Required level of personal protection? ___
b) Required or recommended personal protective/monitoring equipment? ___
c) Use of a photo-ionization detector or HNU meter to check the wellbore headspace prior to sampling in wells known or suspected of being contaminated with volatile organics? ___
d) Special sample handling requirements? ___
e) Periodic medical monitoring for site personnel? ___
f) A field emergency contingency plan? ___
g) The telephone numbers and location of emergency facilities? ___
h) Field personnel training requirements/documentation? ___
l) Physical/chemical hazards discussion? ___

10. Does the SAP specify routine well inspection and maintenance procedures including:

a) Inspection and documentation of all visible components of each monitoring well (See O&M Worksheet 3 of 3) during each groundwater elevation measurement/sampling event? ___

10. (con't): **Y/N/NA**

b) A copy of the well inspection worksheet used to document the above inspections? ___

c) Contingencies for well repair/replacement within a reasonable time frame should the well integrity inspection reveal damage? ___

d) A contingency for inspection of wells contacted by flood waters as soon as such waters recede enough to perform such inspection? ___

e) Measurement of total depth to $\pm$0.1' in each well at least annually? ___

f) Comparison of total versus as-built depths for each well at least annually to assess the degree of well screen occlusion? ___

g) A well redevelopment trigger criterion (e.g., 5-10% of screen) as based on the degree of well screen occlusion/contaminants of concern including a general time frame for such redevelopment? ___

h) Other procedures for periodically assessing subsurface casing integrity (e.g., gauge ring, caliper logs, downwell video logging) including provisions for repair/replacement of wells if indicated? ___

11. Additional comments pertaining to the Sampling & Analysis Plan:

_____

APPENDIX D

PHYSICAL WELL INTEGRITY INSPECTION REPORT

FILE: Solutia, Queeny Plant
St. Louis County

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Matt Blunt, Governor • Doyle Childers, Director
www.dnr.mo.gov

MEMORANDUM

DATE: June 6, 2005

TO: Chris Kump-Mitchell, Environmental Engineer
Groundwater Unit, Permits Section, Hazardous Waste Program, ALPD

FROM: Kurt Hollman, Geologist
Environmental Geology Section, Geological Survey Program, GSRAD

SUBJECT: Solutia - Queeny Plant Operation & Maintenance Inspection Report

LOCATION: N ½, NE ¼, SE ¼, Section 26, T. 54 N., R. 7 E.,
Cahokia 7.5 minute quadrangle, St. Louis County, Missouri
Latitude 38° 36' 34" North, Longitude 90° 11' 40" West

On March 2 and 3, 2005 an inspection of the monitoring well network and water level measuring procedure was performed at Solutia Inc., Queeny chemical plant in St. Louis, Missouri. Sixty-six monitoring wells were inspected for physical integrity with regard to surface seals, inner and outer casings and general well condition. The static water level and total well depth measurements were audited in two monitoring wells. Purging and sampling took place on the same days with personnel from the Environmental Services Program present.

There are several different types of monitoring wells used at the Solutia facility. The condition of the monitoring wells continues to vary from newly installed completions in good condition to older wells that are severely deficient. The newer wells included both above grade and flush mount completions.

The older monitoring wells had a number of deficiencies. Fourteen wells had broken, lifted or cracked surface seals. Fourteen wells had no apparent surface well seal. These wells either lacked a permanent surface seal or had them buried beneath soil or debris.

A hole has developed through the top of the concrete surface well seal at the base of MW-27.

Nine of the monitoring wells lacked sufficient collision protection. Collision protection is especially needed in areas of on-going construction or busy parking lots. Monitoring well HW-3 has suffered severe damage due to collision and should be reconstructed, if possible, or abandoned. Monitoring well MW-2A has suffered a collision resulting in a dented protective casing and a missing locking cap. Several bumper posts at site wells are leaning and have broken concrete foundations indicating previous collisions.

None of the protective well casings, in both new and older wells, were protected with weep holes. Standing water was found inside the annulus of MW-11B. Weep holes drain water that can accumulate within the well annulus, cause corrosion, and shorten the useful life of the monitoring well.

Not all of the wells had a permanent depth-measurement reference point. Some wells had a black marker at the top of riser to indicate the measurement reference point. Other wells were measured from the lock side of the riser.

Many wells are not clearly identifiable. Most flush mount wells lack exterior identification. Numerous above ground completions, even new construction, also lack identification. A site map is often used to help identify monitoring wells.

The static water level and total well depth measurement audit showed close agreement between the consultants for Solutia (URS), and the Geological Survey Program (GSP). On average the GSP measured water levels 0.01 feet deeper than Solutia. On average the GSP measured total well depths 0.10 feet shallower than Solutia. Most discrepancies in measurement values may be attributed to small differences in measuring technique and /or equipment calibration. The small average differences in measurements convince me that accurate water levels are being collected during regularly scheduled sampling periods.

If you have any questions I can be reached by calling (573) 368-2129.

KH/lm

MEASUREMENT, PURGING AND WELL INTEGRITY WORKSHEET
Prepared by MDNR Geological Survey and Resource Assessment Division

Facility Name and Address: **Solutia**
2101 Russell Blvd.
St. Louis, MO 63104-4607

Date of Inspection: March 1-3, 2005

Participants:

Name	Position	Representing
Kurt Hollman	Geologist	MDNR/GSRAD
Eric Sappington	Environmental Specialist	MDNR/ESP
Scott Robinett	Environmental Specialist	MDNR/ESP
Jeff Adams	Geologist	URS
Mike Corbett	Environmental Tech	URS
Justin Prier	Environmental Tech	URS

I. Review of Measurement and Purging Procedures

1. Prior to Well Purging

Y/N/NA

a) Are the well numbers clearly marked on the well? Yes
If yes, how and where: Adhesive lettering on some above ground completions. Flush mount wells are not marked.

b) Were measures taken to prevent evacuation/sampling equipment from contacting potentially contaminated surfaces? Yes
If yes, what measures: Plastic poly sheeting placed around the base of the well.

c) Were static water levels measured? Yes

d) Were depths to bottom of the wells measured? After purge/sample. Yes

e) Are measurements taken to the nearest 0.01 feet? Yes

f) Is there a permanent depth measurement reference point at each well? No
If yes, where is this point located: No permanent mark, measured from lock side of the well.

Y/N/NA

g) Description of depth measuring device used (type, manufacturer, model): CE model 2541. E.W.L.I. Interface probe.

h) Was depth-measuring device cleaned and dried after each measurement? Yes
If yes, describe procedure. Alconox wash, D.I. water rinse plus 3 paper towel dry

i) Record any well audit measurements made below:

GSRAD			Facility	
Well Number	**Depth to Water (feet)**	**Depth to Well Bottom (feet)**	**Depth to Water (feet)**	**Depth to Well Bottom (feet)**
MW-3	12.27	30.12	12.27	30.27 (soft)
REC	12.17	67.20 (soft)	12.16	67.24

2. Detection and Sampling of Immiscible Layers **Y/N/NA**

a) Are procedures used which will detect light phase immiscible layers? Yes
If yes, describe: Interface probe.

b) Are procedures used which will detect dense phase immiscible layers? Yes
If yes, describe: Interface probe.

c) Are any detected immiscible layers sampled separately prior to well evacuation? If yes, describe procedure: No

d) Do both procedures used minimize mixing with the aqueous phase?
Measuring with probe minimizes mixing.

3. Well Evacuation

a) Are low-yielding wells evacuated to dryness? No

b) Are high yielding wells evacuated until the well purging parameters of pH, temperature and specific conductance have stabilized to ±10% over two successive well purge volumes? Low flow purge. No

Y/N/NA

c) If no to b, are at least three well casing volumes purged from high yielding wells? May purge approximately 2.5 liters for stabilization. No

d) Describe field method used to calculate the volume of evacuated fluid:
Minimum purge 750 ml, then monitor until parameters stabalize.

e) Describe field method used to measure the volume of evacuated fluid:
250 ml cup is filled, number of full cups counted to calculate volume extracted..

f) Describe field procedure for collection, management and disposal of evacuated fluid: Fluid placed in 5 gallon buckets, then sent in sewer if permitted (need permit).

g) If evacuated fluids are disposed of on the ground, how far from the wellbore are such fluids disposed: N/A

h) Does each well have dedicated evacuation equipment? No
Disposeable tubing, pump Decon with Alconox and DI water.

i) Describe well evacuation equipment (type, composition, manufacturer, model, etc.) including delivery lines used to lower equipment into the well:
In-situ mini troll 9000 water quality monitor.
S. S. Monsoon Groundwater Pump, 1/2" O.D. LDPE tubing.

j) Describe the decontamination procedure used for non-dedicated evacuation equipment: Liqninox wash, DI water rinse, paper towel dry.

k) Describe the physical properties of the evacuated water:

Well Number.	MW-3							
Color	Gray							
Odor	No							
Oil/grease	No							
Turbidity	V.heavy							

II. Visual Well Integrity Inspection

1. For all wells inspected, describe the material type (e.g., concrete, soils, etc.) and condition (e.g., intact, cracked, broken, lifted, pulled-away, etc.) of the surface well seal (i.e., the material surrounding the well casing at the ground surface). Also describe the material type (e.g., PVC,

steel) and condition (e.g., intact, cracked, broken, bent, lifted, etc.) of both the outer protective well casing and inner casing riser.

(1 of 3 - Visual Well Integrity Inspection)

	Well Number	Surface Well Seal		Outer Protective Well Casing		Inner Well Riser	
		Type	Condition	Type	Condition	Type	Condition
1	MW-3	Concrete	Broken at bumper post	Steel	Intact	PVC	Intact
2	REC-1	Asphalt	Intact	Manhole	Intact	PVC/SS	Intact
3	REC-2	Asphalt	Intact	Manhole	Intact	PVC/SS	Intact
4	REC-3	Asphalt	Cracked	Manhole	Intact	PVC/SS	Intact
5	REC-4	Asphalt	Intact	Manhole	Intact	PVC/SS	Intact
6	OBW-1	Concrete	Crumbling	Steel	Rusted/bent	PVC	Intact
7	OBW-2	Concrete	Badly cracked	Steel	Rusted	PVC	Intact
8	LPZ-3	Concrete	Intact	Flush	Intact	PVC	Intact
9	LPZ-1	Concrete	Gravel covered	Flush	Intact	PVC	Intact
10	LPZ-2	Concrete	Intact	Flush	Intact	PVC	Intact
11	LPZ-3	Concrete	Cracked	Flush	Intact	PVC	Intact
12	LPZ-4	Concrete	Intact	Flush	Intact	PVC	Intact
13	PZ-1	Concrete	Cracked edges	Flush	Intact	PVC	Intact
14	OBW-3	Concrete	Intact	Steel	Intact	N/I	N/I
15	MW-19	Gravel	Loose	Steel	Intact	N/I	N/I
16	MW-2B	Soil	Loose	Steel	Rusted	PVC	Intact
17	MW-2A	Soil	Loose	Steel	Rusted/bent	PVC	Broken at top
18	MW-2R	Soil	Loose	Steel	Rusted	N/A	N/A
19	MW-17	Concrete	Intact	Steel	Intact	PVC	Intact
20	MW-18A	Concrete	Lifted	Steel	Intact	PVC	Intact
21	MW-18B	Concrete	Lifted/broke	Steel	Intact	PVC	Intact
22	OBS-1	Asphalt	Intact	Steel	Intact	PVC	Intact
23	MW-7B	Asphalt	Intact	Steel	Intact	PVC	Intact
24	MW-7A	Asphalt	Intact	Steel	Intact	N/I	N/I
25	TW-1	Concrete	Cracked	Steel	Rusted	N/A	N/A
26	MW-30A	Concrete	Intact	Flush	Intact	N/I	N/I
27	MW-30B	Concrete	Intact	Flush	Intact	N/I	N/I
28	MW-29	Concrete	Intact	Steel	Intact	PVC	Intact
29	MW-8R	Concrete	Broken	Steel	Intact	PVC	Intact
30	MW-8A	Concrete	Intact	Steel	Intact	PVC	Intact

(2 of 3 - Visual Well Integrity Inspection)

	Well Number	Surface Well Seal		Outer Protective Well Casing		Inner Well Riser	
		Type	Condition	Type	Condition	Type	Condition
31	MW-8B	Concrete	Broken	Steel	Intact	PVC	Intact
32	MW-31B	Concrete	Intact	Steel	Intact	PVC	Intact
33	MW-32B	Concrete	Intact	Steel	Intact	PVC	Intact
34	MW-33B	Concrete	Intact	Steel	Intact	PVC	Intact
35	MW-34B	Concrete	Intact	Steel	Intact	PVC	Intact
36	MW-24B	Concrete	Intact	Steel	Intact	PVC	Intact
37	MW-24A	Concrete	Lifted	Steel	Intact	PVC	Intact
38	MW-35B	Concrete	Intact	Steel	Intact	PVC	Intact
39	VW-1	Soil	Loose	Steel	Intact	PVC	Intact
40	VW-2B	Concrete	Intact	Steel	Intact	PVC	Intact
41	VW-2	Soil	Loose	Steel	Rusted	PVC	Intact
42	MW-25B	Concrete	Intact	Steel	Intact	PVC	Intact
43	MW-25A	Concrete	Intact	Steel	Intact	PVC	Intact
44	HW-1	Concrete	Intact	Steel	Intact	PVC	Intact
45	HW-1B	Soil	Loose	Steel	Intact	PVC	Intact
46	HW-3	Gravel	Loose	Steel	Badly bent	N/I	Broken
47	MW-15	Gravel	Loose	Steel	Rusted	PVC	Intact
48	MW-20	Asphalt	Intact	Steel	Intact	PVC	Intact
49	MW-28A	Concrete	Intact	Steel	Intact	PVC	Intact
50	MW-28B	Concrete	Intact	Steel	Intact	PVC	Intact
51	MW-9	Gravel	Loose	Steel	Intact	PVC	Intact
52	MW-21R	Asphalt	Cracked	Steel	Intact	N/A	N/A
53	MW-4	Gravel	Loose	Steel	Intact	PVC	Intact
54	MW-22	Concrete	Intact	Steel	Intact	PVC	Intact
55	GM-3	Ashpalt	Intact	Steel	Rusted	PVC	Intact
56	MW-14	Concrete	Cracked/broken	Steel	Intact	PVC	Intact
57	GM-1	Concrete	Lifted	Steel	Intact	PVC	Intact
58	GM-2	Concrete	Lifted	Steel	Intact	PVC	Intact
59	MW-11A	Gravel	Loose	Steel	Intact	PVC	Intact
60	MW-11B	Concrete	Intact	Steel	Intact	PVC	Intact

(3 of 3 Visual Well Integrity Inspection)

Well Number	Surface Well Seal		Outer Protective Well Casing		Inner Well Riser	
	Type	Condition	Type	Condition	Type	Condition
MW-11C	Gravel	Loose	Steel	Intact	PVC	Intact
MW-26	Concrete	Intact	Steel	Intact	PVC	Intact
QS-1	Gravel	Loose	Steel	Rusted	PVC	Intact
MW-13R	Concrete	Intact	Steel	Rusted	PVC	Intact
MW-13	Gravel	Loose	Steel	Intact	PVC	Intact
MW-23	Concrete	Intact	Steel	Intact	PVC	Intact

NI= Not Inspected; SS= Stainless Steel; N/A = Not Applicable: PVC = Polyvinyl Chloride; NM = Not Measured: NON = Non-locking; Dia = Diameter: MH =Manhole

2. For all wells inspected, describe the physical properties of the surface well seal (i.e., approximate diameter (inches/feet), % coverage surrounding well casing, sloped away from wellbore to promote drainage (yes/no), water ponding (yes/no) or surface run-off flow (yes/no), evident around or near wellbore).

(1 of 3 Surface Wells Seals)

	Surface Wells Seals					
	Well Number	**Dimension: feet and/or diameter**	**% Coverage**	**Sloped?**	**Ponding?**	**Run-off?**
1	MW-3	2 X 2	100	Yes	No	Yes
2	REC-1	Parking lot	100	Yes	No	Yes
3	REC-2	Parking lot	100	Yes	No	Yes
4	REC-3	Parking lot	100	Yes	No	Yes
5	REC-4	Parking lot	100	Yes	No	Yes
6	OBW-1	Parking lot	N/A	Yes	No	Yes
7	OBW-2	2	90	Yes	No	Yes
8	LPZ-3	2	100	No	No	Yes
9	LPZ-1	3	100	No	No	Yes
10	LPZ-2	3	100	No	No	Yes
11	LPZ-3	2 X 2	100	No	No	Yes
12	LPZ-4	3	100	No	No	Yes
13	PZ-1	2	100	No	No	Yes
14	OBW-3	3 X 3	100	No	No	Yes
15	MW-19	Gravel covered	N/A	No	No	Yes
16	MW-2B	N/A	0	Yes	No	Yes
17	MW-2A	N/A	0	Yes	No	Yes
18	MW-2R	N/A	0	Yes	No	Yes
19	MW-17	4 X 4	100	No	No	Yes
20	MW-18A	2	100	Yes	No	Yes
21	MW-18B	2	100	Yes	No	Yes
22	OBS-1	Parking lot	100	Yes	No	Yes
23	MW-7B	Parking lot	100	Yes	No	Yes
24	MW-7A	Parking lot	100	Yes	No	Yes
25	TW-1	2	100	Yes	No	Yes
26	MW-30A	Parking lot	100	Yes	No	Yes
27	MW-30B	Parking lot	100	Yes	No	Yes
28	MW-29	Parking lot	100	Yes	No	Yes
29	MW-8R	Parking lot	100	Yes	No	Yes
30	MW-8A	3 X 5	100	No	No	Yes

(2 of 3 Surface Wells Seals)

	Surface Wells Seals					
	Well Number	**Dimension: feet and/or diameter**	**% Coverage**	**Sloped?**	**Ponding?**	**Run-off?**
31	MW-8B	2	100	Yes	No	Yes
32	MW-31B	2	100	Yes	No	Yes
33	MW-32B	2 X 2	100	Yes	No	Yes
34	MW-33B	2 X 2	100	Yes	No	Yes
35	MW-34B	2 X 2	100	Yes	No	Yes
36	MW-24B	2 X 2	100	No	No	Yes
37	MW-24A	2 X 2	100	No	No	Yes
38	MW-35B	2 X 2	100	Yes	No	Yes
39	VW-1	0	0	No	No	Yes
40	VW-2B	1.5	100	No	No	Yes
41	VW-2	0	0	No	Yes	Yes
42	MW-25B	2 X 2	100	No	No	Yes
43	MW-25A	2 X 2	100	No	No	Yes
44	HW-1	2 X 2	100	No	No	Yes
45	HW-1B	0	0	No	No	Yes
46	HW-3	0	0	No	Yes	Yes
47	MW-15	0	0	No	Yes	Yes
48	MW-20	Parking Lot	100	Yes	No	Yes
49	MW-28A	2 X 2	100	Yes	No	Yes
50	MW-28B	2 X 2	100	No	No	Yes
51	MW-9	0	0	No	No	Yes
52	MW-21R	Parking Lot	100	Yes	No	Yes
53	MW-4	0	0	Yes	No	Yes
54	MW-22	2 X 2	100	No	No	Yes
55	GM-3	Parking Lot	100	Yes	No	Yes
56	MW-14	2	100	Yes	No	Yes
57	GM-1	2	100	No	No	Yes
58	GM-2	2	100	No	No	Yes
59	MW-11A	0	0	No	No	Yes
60	MW-11B	2	100	Yes	No	Yes

(3 of 3 Surface Wells Seals)

	Surface Wells Seals					
	Well Number	Dimension: feet and/or diameter	% Coverage	Sloped?	Ponding?	Run-off?
61	MW-11C	0	0	No	No	Yes
62	MW-26	2 X 2	100	No	No	Yes
63	QS-1	0	0	No	No	Yes
64	MW-13R	1	100	Yes	No	Yes
65	MW-13	0	0	No	No	Yes
66	MW-23	2 X 2	100	No	No	Yes
67						
68						
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90						

3. For all wells inspected, detail the following items related to the surface protective casing and well casing riser: 1) Protective casing cap type (e.g., screw-type, hinged), composition (e.g., PVC, steel), security configuration (i.e., locking, non-locking) and condition (i.e., intact, cracked); 2) Is there a drainage hole in the protector casing? (yes/no); Is it open? (yes/no); How far above ground level is the hole? (inches/feet); 3) Are protective posts installed around the well? (yes/no).

(1 of 1 Accessory Well Information)

	Accessory Well Information								
		Casing Cap				Drainage Hole			
	Well Number	Type	Composite	Configure	Condition	Hole ?	Open ?	Height (inches)	Posts?
1	MW-3	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes (3)
2	REC-1	MH	Steel	Non	Intact	N/A	N/A	N/A	N/A
3	REC-2	MH	Steel	Non	Intact	N/A	N/A	N/A	N/A
4	REC-3	MH	Steel	Non	Intact	N/A	N/A	N/A	N/A
5	REC-4	MH	Steel	Non	Intact	N/A	N/A	N/A	N/A
6	OBW-1	Hinged	Steel	Locking	Intact	No	N/A	N/A	No
7	OBW-2	Hinged	Steel	Locking	Intact	No	N/A	N/A	No
8	LPZ-3	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
9	LPZ-1	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
10	LPZ-2	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
	LPZ-3	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
	LPZ-4	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
13	PZ-1	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
14	OBW-3	Hinged	Steel	Locked	Rusted	No	N/A	N/A	N/A
15	MW-19	Hinged	Steel	Locking	Intact	N/I	N/I	N/A	Yes (3)
16	MW-2B	Hinged	Steel	Locking	Bent/rusted	No	N/A	N/A	No
17	MW-2A	Hinged	Steel	Locking	Severely bent	No	N/A	N/A	No
18	MW-2R	Boyer	AL	Locking	Intact	N/A	N/A	N/A	Yes (3)
19	MW-17	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes (2)
20	MW-18A	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes
21	MW-18B	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes
22	OBS-1	Oversize	Steel	Locking	Intact	No	N/A	N/A	Yes (3)
23	MW-7B	Hinged	Steel	Locking	Intact	Yes	Yes	4"	Yes (3)
24	MW-7A	Hinged	Steel	Locking	Intact	N/I	N/I	N/I	Yes (3)
25	TW-1	Boyer	AL	Locking	Intact	N/A	N/A	N/A	Yes (3)
26	MW-30A	Bolt cap	Steel	Non	Intact	N/A	N/A	N/A	N/A
27	MW-30B	Bolt cap	Steel	Non	Intact	N/A	N/A	N/A	N/A
28	MW-29	Hinged	Steel	Locking	Intact	No	N/A	N/A	N/A
29	MW-8R	Oversized	Steel	Locking	Intact	No	N/A	N/A	N/A
30	MW-8A	Hinged	Steel	Locking	Intact	No	N/A	N/A	N/A

(2 of 3 Accessory Well Information)

	Accessory Well Information								
		Casing Cap				Drainage Hole			
	Well Number	Type	Composite	Configure	Condition	Hole ?	Open ?	Height (inches)	Posts?
31	MW-8B	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes (3)
32	MW-31B	MH	Steel	Non	Intact	N/A	N/A	N/A	N/A
33	MW-32B	MH	Steel	Non	Intact	N/A	N/A	N/A	N/A
34	MW-33B	MH	Steel	Non	Intact	N/A	N/A	N/A	N/A
35	MW-34B	MH*	Steel	Non	Intact	N/A	N/A	N/A	N/A
36	MW-24B	Hinged	Steel	Locking	Intact	No	N/A	N/A	No
37	MW-24A	Hinged	Steel	Locking	Intact	No	N/A	N/A	No
38	MW-35B	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
39	VW-1	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
40	VW-2B	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
41	VW-2	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
42	MW-25B	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
43	MW-25A	Robco	AL	Non	Intact	N/A	N/A	N/A	N/A
44	HW-1	Hinged	Steel	Locked	Rusted	No	N/A	N/A	N/A
45	HW-1B	Hinged	Steel	Locking	Intact	N/I	N/I	N/A	Yes (3)
46	HW-3	Hinged	Steel	Locking	Bent/rusted	No	N/A	N/A	No
47	MW-15	Hinged	Steel	Locking	Severely bent	No	N/A	N/A	No
	MW-20	Boyer	AL	Locking	Intact	N/A	N/A	N/A	Yes (3)
49	MW-28A	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes (2)
50	MW-28B	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes
51	MW-9	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes
52	MW-21R	Oversize	Steel	Locking	Intact	No	N/A	N/A	Yes (3)
53	MW-4	Hinged	Steel	Locking	Intact	Yes	Yes	4"	Yes (3)
54	MW-22	Hinged	Steel	Locking	Intact	N/I	N/I	N/I	Yes (3)
55	GM-3	Boyer	AL	Locking	Intact	N/A	N/A	N/A	Yes (3)
56	MW-14	Bolt cap	Steel	Non	Intact	N/A	N/A	N/A	N/A
57	GM-1	Bolt cap	Steel	Non	Intact	N/A	N/A	N/A	N/A
58	GM-2	Hinged	Steel	Locking	Intact	No	N/A	N/A	N/A
59	MW-11A	Oversized	Steel	Locking	Intact	No	N/A	N/A	N/A
60	MW-11B	Hinged	Steel	Locking	Intact	No	N/A	N/A	N/A

(3of 3 Accessory Well Information)

	Accessory Well Information								
	Casing Cap					Drainage Hole			
	Well Number	Type	Composite	Configure	Condition	Hole ?	Open ?	Height (inches)	Posts?
61	MW-11C	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes (3)
62	MW-26	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes (3)
63	QS-1	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes (3)
64	MW-13R	Oversized	Steel	Locking	Intact	No	N/A	N/A	Yes (3)
65	MW-13	Hinged	Steel	Locking	Intact	No	N/A	N/A	Yes (3)
66	MW-23	Hinged	Steel	Locking	Intact	Yes	Yes	1	Yes (3)
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
78									
79									
80									
81									
82									
83									
84									
85									
86									
87									
88									
89									
90									

MEASUREMENT DIFFERENCE		
Well #	Depth to Water	Total Depth
MW-3	0.00	-0.15
REC-4	+0.01	-0.04

APPENDIX E

SPLIT SAMPLING RESULTS
&
INVESTIGATION REPORT

RCRA OPERATION & MAINTENANCE (O & M) GROUNDWATER MONITORING FIELD AUDIT REPORT

Solutia, Incorporated
John F. Queeny Plant
201 Russell
St. Louis, Missouri

March 2-3, 2005

Prepared For:

Missouri Department of Natural Resources
Air and Land Protection Division
Hazardous Waste Program

Prepared By:

Missouri Department of Natural Resources
Air and Land Protection Division
Environmental Services Program

Table of Contents

1.0 Introduction

The Missouri Department of Natural Resources (MDNR), Hazardous Waste Program (HWP) requested the MDNR, Environmental Services Program (ESP) to conduct a groundwater monitoring field audit at the Solutia, Inc., John F. Queeny Plant located at 201 Russell in St. Louis, Missouri. The field audit was done in support of the MDNR's agreement with the U.S. Environmental Protection Agency (EPA) to conduct Groundwater Compliance Monitoring Program inspections at Resource Conservation and Recovery Act (RCRA) regulated facilities. The field audit was conducted on March 2-3, 2005.

Solutia hired the URS Corporation to conduct the groundwater monitoring activities. The equipment and methods used by the URS sampling team were observed and critiqued by ESP representatives Eric Sappington and Scott Robinett (see Appendix A – Sampling and Analysis Procedures Worksheet). In addition, the ESP representatives collected split groundwater samples for independent analysis conducted at the ESP State Environmental Laboratory. URS had three field staff on-site: Jeff Adams, Justin Prien, and Mike Corbett. Kurt Hollman, with the MDNR, Geology Survey and Resource Assessment Division (GSRAD), was on-site to evaluate monitoring well conditions, record well depth measurements, photograph each monitoring well, and observe well evacuation procedures.

2.0 Site Description and History

2.1 Site Location

The Solutia plant is located at 201 Russell, between Broadway and the Mississippi River, in St. Louis, Missouri.

2.2 Site Description

The site is a large chemical manufacturing facility that had essentially shut down all operations at the time of the groundwater monitoring field audit. The Solutia property is located on flat terrain adjacent to the Mississippi River. The surrounding land use appears to be industrial.

2.3 Site History/Contaminants of Concern

The Solutia plant has manufactured chemical products at the site for many years. Detailed information regarding the site can be found in the HWP files. The contaminants of concern, based upon the sampling request developed by the HWP, include volatile organic compounds, base neutral and acid extractable organic compounds, lead, and arsenic.

3.0 Methods

3.1 Field Procedures

The procedures used by the URS sampling team for collecting groundwater samples were documented in a worksheet that is attached to this report as Appendix A. The field procedures are summarized below. The field audit conducted by the ESP representatives included the collection of split groundwater samples for independent analysis at the ESP State Environmental Laboratory. In the sampling request, the HWP requested that split samples be collected from four of the five monitoring wells that were scheduled to be sampled by the URS sampling team: MW-3, Rec-1, Rec-4, LPZ-2, and LPZ-5. The one well not split-sampled by the ESP was LPZ-2.

Each well was evacuated and sampled by the URS sampling team using a non-dedicated impeller-driven pump made of stainless steel and Teflon parts. The pump tubing was dedicated to each well. Micropurging, or low-flow, techniques were used to evacuate each well prior to collecting samples. Field parameters (pH, specific conductance, temperature, dissolved oxygen, and oxidation-reduction) were used to determine when each well was stabilized and ready to sample. The static water level was measured throughout the evacuation procedure to ensure that excessive drawdown was not occurring. Each well was sampled immediately after it was determined that the field parameters had stabilized. All non-dedicated equipment was decontaminated between wells.

The HWP requested the ESP to measure field parameters (pH, specific conductance, and temperature) and to collect groundwater samples for volatile organics, base neutral/acid extractable organics, lead, and arsenic at each well. The URS sampling team collected samples for a different set of parameters: volatile organics, dissolved gases, chloride, alkalinity, carbon dioxide, sulfate, nitrate, and total organic carbon.

The following table summarizes the samples that were collected by the ESP:

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL PARAMETERS
0502372	Trip blank	VOA, BNA
0502373	MW-3	VOA, BNA, Pb, and As
0502374	Rec-4	VOA, BNA, Pb, and As
0502375	Rec-1	VOA, BNA, Pb, and As
0502376	Rec-4 (blind duplicate)	VOA, BNA, Pb, and As
0502377	LPZ-5	VOA, BNA, Pb, and As

3.2 Chain-of-Custody

All samples collected by the ESP representatives were given a numbered label and placed on ice in a cooler. A chain-of-custody form was completed, which recorded the label numbers assigned to each sample, the description of the location of the sample collected, the time and date collected, and the parameters to be analyzed.

The ESP representatives maintained custody of the samples by hand delivering them to the State Environmental Laboratory within the ESP in Jefferson City where they were relinquished to laboratory personnel.

3.3 Analyses Requested

To reiterate, the groundwater samples collected by the ESP were submitted for laboratory analyses of volatile organics, base neutral/acid extractable organics, lead, and arsenic.

3.4 Quality Assurance/Quality Control (QA/QC)

All samples were analyzed in accordance with the general requirements and standard operating procedures described in the Fiscal Year 2005 Generator/TSD Quality Assurance Project Plan. One blind duplicate sample (0502376) and one trip blank sample (0502372) were collected for QA/QC purposes.

4.0 Investigation Derived Wastes

Since micropurging techniques were used, there was very little evacuation wastewater to manage. The small quantity of evacuation water that was generated was collected and stored temporarily on-site until proper disposal could be arranged.

5.0 Observations

The weather was sunny and cold on the two days that the ESP representatives were on site.

Other observations related to the sampling equipment and methods used by the facility sampling personnel were recorded in the field and described in detail in the Sampling and Analysis Procedures Worksheet attached as Appendix A.

6.0 Data Reporting

Please refer to Appendix B for analytical results of samples collected.

Submitted by: _____

Eric Sappington
Environmental Specialist
Field Services Section
Environmental Services Program

Date: May 18, 2005

Approved by: _____

Earl Pabst
Director
Environmental Services Program

EP:est

APPENDIX A

Sampling and Analysis Procedures Worksheet

Solutia, Incorporated
March 2-3, 2005

RCRA Operation and Maintenance (O & M) Field Audit

Sampling and Analysis Procedures Worksheet
Prepared by the MDNR Environmental Services Program

Facility Name and Address: Solutia, Inc.
201 Russell
St. Louis, MO

Date(s) of Sampling: March 2-3, 2005

Lab Name and Address: Severn-Trent Laboratories
5102 Laroche Avenue
Savannah, GA 31404 phone: (912) 354-7858

Participants:

Name	Position	Representing
Eric Sappington	Environmental Specialist	MDNR-ESP
Kurt Hollman	Geologist	MDNR-GSRAD
Scott Robinett	Environmental Specialist	MDNR-ESP
Jeff Adams	Senior Geologist	URS
Justin Prien	Environmental Specialist	URS
Mike Corbett	Environmental Specialist	URS

I. Review of Sampling and Analysis Procedures

1. Prior to Well Evacuation (ESP use only if DGLS has not evaluated):

   a. Are the well numbers clearly marked on the well?
   If yes, how are they marked and where?

   Note: GSRAD evaluated all of the Section 1 elements.

   b. Were measures taken to prevent evacuation/sampling equipment from contacting potentially contaminated surfaces?
   If yes, what measures?

c. Were static water levels measured?

d. Were total well depths measured?

e. Are measurements taken to the nearest 0.01 feet?

f. Is there a permanent depth measurement reference point at each well?
If yes, where is this point located?

g. Description of depth measuring device used (type, manufacturer, model):

h. Was depth measuring device cleaned and dried after each measurement?
If yes, describe decontamination procedure:

2. Detection/Sampling of Immiscible Layers (ESP use only if DGLS has not evaluated):

a. Are procedures used which will detect light phase immiscible layers?
If yes, describe:

Note: GSRAD evaluated all of the Section 2 elements.

b. Are procedures used which will detect dense phase immiscible layers?
If yes, describe:

c. Are any detected immiscible layers sampled separately prior to well evacuation?
If yes, describe the procedure:

d. Do the procedures used minimize mixing with the aqueous phase?

3. Well Evacuation (ESP use only if DGLS has not evaluated):

a. Are low yielding wells evacuated to dryness?

Note: GSRAD evaluated all of the Section 3 elements, except for item j.

b. Are high yielding wells evacuated until the parameters of pH, temperature, and specific conductance have stabilized to $\pm$ 10% over two successive well purge volumes?

c. If no to b, are at least three well casing volumes purged from high yielding wells?

d. Describe field method used to calculate the volume of evacuated water:

e. Describe field method used to measure the volume of evacuated water:

f. Describe procedure used for collection, management, and disposal of evacuated water:

g. Does each well have dedicated evacuation equipment?

h. Describe well evacuation equipment (type, composition, manufacturer, model, etc.) including delivery lines used to lower equipment into well:

i. Describe the decontamination procedure used for non-dedicated evacuation equipment:

j. Describe the physical properties of the evacuated water:

Well Number	*MW-3*	*REC-4*	*REC-1*	*LPZ-5*
Color	*Light brown*	*Clear*	*Clear*	*Dark gray*
Odor				
Oil/Grease	*None*	*None*	*None*	*None*
Turbidity	*Moderate*	*Low*	*Low*	*Low*

4. Sample Withdrawal (ESP use only if DGLS has not evaluated):

a. In what sequence were the wells sampled?

The wells split-sampled by the ESP were sampled in the following order: MW-3, REC-4, REC-1, LPZ-5.

b. Were wellbore fluid levels checked in low yield wells prior to sample collection to determine if sufficient fluid was available to sample for the parameters of concern?

The sampling team used micropurging techniques and kept a water level indicator probe in each well to monitor the static water level throughout the purging and sampling procedure.

c. Were low yield wells sampled as soon as sufficient wellbore fluid volume was available?

Yes.

d. For low yield wells, on average how much time elapsed between well purging and sampling?

The wells were sampled immediately after purging.

e. Were wellbore fluid levels checked in high yield wells prior to sample collection to determine the percent recovery of wellbore fluids?

Yes.

f. According to the facility's sampling personnel, approximately what percent fluid recovery is deemed adequate prior to sampling high yield wells?

The facility sampling personnel stated that they had no defined percent fluid recovery goals. Because they were using micropurging techniques, the drawdown was minimal and each well was sampled immediately after purging regardless of the percent fluid recovery.

g. Were high yield wells allowed to achieve this percent recovery prior to sample collection?

See above response to item 4.f.

h. For high yield wells, on average how much time elapsed between well purging and sampling?

All wells were sampled immediately after purging.

i. Describe well sampling equipment (type, composition, manufacturer, model, etc.) including delivery lines used to lower equipment into the well:

The non-dedicated pump was an SS Monsoon, ProActive, stainless steel and Teflon impeller-driven pump. The main tubing attached to the pump was dedicated and made of LDPE (low density polyethylene). A non-dedicated flow-through cell at the well head housed the various water quality field analysis probes used to measure pH, conductivity, etc. The sample was collected via a non-dedicated Teflon valve that was attached to the LDPE tubing prior to entering the flow-through cell. A short piece of dedicated silicon tubing was attached to the valve to allow for sample collection. A non-dedicated water level indicator was also used.

j. Does each well have a dedicated sampling device?

The pump tubing was dedicated. Everything else that came in contact with the groundwater was non-dedicated.

k. If no to j, is non-dedicated equipment decontaminated between wells?

Yes.

l. Describe the decontamination procedure used for non-dedicated sampling equipment:

All non-dedicated equipment (the pump, the flow-through cell and water quality probes, the sampling valve, and the water level indicator) was decontaminated with a distilled water and Liquinox solution between wells. The soap solution was cycled through the pump for several minutes. All equipment was rinsed with distilled water and wiped dry with paper towels.

m. Is non-dedicated sampling equipment thoroughly dried before each use?

Paper towels were used to wipe the equipment dry when decontamination was completed.

n. For non-dedicated sampling equipment, were equipment blanks collected to monitor for potential sample cross-contamination?

Yes. An equipment blank was collected from the pump following sample collection at well REC-1 and decontamination.

o. If yes to n, how frequently were equipment blanks collected?

Once during the sampling event.

p. Describe the procedure used to collect equipment blanks:

The top was cut off a new one-gallon container of distilled water. The pump was placed in the container. A piece of new silicone tubing was attached to the pump outlet. The pump was turned on and a sample of the distilled water was collected as it flowed out of the tubing. The equipment blank was to be analyzed for VOA only.

q. Were duplicate samples collected?

Yes.

r. If yes to q, how frequently are duplicate samples collected?

Once during the sampling event or once for every 10% of samples collected, whichever is more frequent.

s. Describe the duplicate sampling procedures:

Containers for the true sample and the duplicate sample were filled alternatively, starting with the VOA vials, then vials for dissolved gasses, and so on.

t. Was care taken to avoid placing clean sampling equipment on the ground or other potentially contaminated surfaces prior to use?

Yes, clean plastic sheeting was placed around each well to create a clean work surface. The clean tubing was kept wrapped in a plastic bag. The URS personnel appeared to be very careful to keep their sampling equipment clean.

u. If bailers were used, were they lowered and raised slowly enough to prevent sample degassing or volatilization of sensitive parameters?

Bailers were not used.

v. If volatile organics were sampled with a pump, was the sample collection pump rate at or below 100 ml/minute?

No.

w. If no to v, what was the sample collection pump rate?

The pump rate was set between 200 and 250 ml/minute. It appeared to be low enough to prevent agitation or aeration of the sample.

x. Were samples transferred directly from the sampling device to the sample containers?

Yes.

y. Describe the sample transfer procedure:

The sample containers were filled directly from the pump discharge tubing.

z. Describe the method used to obtain split samples:

The facility sampling team and the ESP representative alternated filling their respective containers.

aa. Overall, were samples collected in a manner which would minimize changes in the sample due to adsorption, aeration, agitation, volatilization, etc.?

Yes, with one minor issued that was noted. While the URS sampling personnel typically held their VOA vials at an angle when filling in order to minimize aeration, there were a couple of occasions when they were observed holding the vial completely vertical which resulted in a few air bubbles being generated. The air bubbles were allowed to pop prior to closing the container so that there was no headspace in the vial. The procedure was discussed in the field with the URS personnel and corrected.

bb. If no to aa, describe any potential problems observed:

Not applicable.

cc. Were samples collected and containerized in the order of site-specific parameter's volatilization sensitivity (e.g. in descending order – VOA, TOX, TOC, semi-volatiles, metals and cyanide, major water quality cations and anions, radionuclides)?

Yes.

dd. Were samples collected for dissolved metals?

No.

ee. If yes to dd, were the samples field filtered using a 0.45 micron filter?

Not applicable.

ff. If yes to dd, but no to ee, please explain:

gg. List any parameters measured in the field by the facility:

The URS sampling personnel measured pH, conductivity, temperature, dissolved oxygen, oxidation-reduction, and iron in the field.

hh. Describe the equipment (type, manufacturer, model) used by the facility for taking field measurements:

pH	*In-situ brand, Troll 9000 model*
temperature	" "
conductivity	" "
dissolved oxygen	" "
oxidation-reduction	" "
iron	*Hach DR 2000*

ii. List the values for any field measurements taken by the facility:

Well number	*MW-3*	*REC-4*	*REC-1*	*LPZ-5*	
pH	*6.72*	*6.5*	*7.3*	*7.32*	
Temperature °C	*16.5*	*16.4*	*15.3*	*14.6*	
Conductivity (µmhos)	*6328*	*2759*	*881*	*2371*	
Oxygen-Reduction	*102*	*17*	*120*	*178*	
Dissolved Oxygen	*1.46*	*0.43*	*3.6*	*0.73*	

jj. Describe all field equipment calibration and maintenance procedures:

URS personnel used a multi-function meter that is calibrated using a multi-parameter solution. The meter was calibrated upon arrival at the site each morning. The multi-parameter solution is poured into the flow-through cell and the meter runs through an automated calibration sequence.

kk. Are the procedures under jj performed pursuant to the manufacturer's recommendations and consistent with accepted protocol (e.g. SW-846)?

According to URS personnel, the calibration procedure used is what the manufacturer recommends. One criticism of the procedure is that the pH meter is one-point calibrated to a 7 pH buffer. Standard protocol for pH meter calibration requires two-point calibration, making an effort to use buffers that will bracket the expected pH value of the sample.

ll. Is a field logbook and/or individual well sampling sheets maintained?

Both a field logbook and individual well sampling sheets are used to record field data and observations.

Are the following items documented in either or both of the above:

Date and time of sampling?	*Yes*
Weather conditions?	*Yes*
Field sampling participants?	*Yes*
Observations and physical well integrity?	*Yes*
Field equipment descriptions?	*Yes*
Field analysis results?	*Yes*
Field equipment and calibration/maintenance information?	*Yes*
Any other pertinent field observations or unusual conditions?	*Yes*

mm. Who maintains the field logbook/well sampling sheets?

URS maintains the documentation and sends copies to the facility.

nn. Describe the physical properties of the groundwater samples:

Well number	*MW-3*	*REC-4*	*REC-1*	*LPZ-5*	
Color	*Light brown*	*Clear*	*Clear*	*Clear*	
Oil/Grease	*None*	*None*	*None*	*None*	
Turbidity	*Moderate*	*Low*	*Low*	*Low*	

5. Sample Preparation and Handling:

a. List the sample containers and preservation methods used by the facility for each parameter or group of parameters to be analyzed:

Parameter/Group	**Sample Container**	**Preservation**
Volatile organics	40 ml vials	cold + hydrochloric acid
Dissolved gases	40 ml vials	cold
Chloride/alkalinity/CO_2/sulfate/nitrite	500 ml plastic	cold
Total organic carbon	4 oz amber glass	cold + hydrochloric acid
Nitrate	500 ml plastic	cold

b. Were the sample containers utilized for specific parameters consistent with current guidance (e.g. SW-846)?

Yes.

c. Were any of the sample containers pre-cleaned prior to use (i.e., solvent-rinsed, baked, etc.)

The sample containers were provided by the laboratory contracted to conduct the analyses. URS personnel were unsure of any pre-cleaning that the lab may have done.

d. Were the samples preserved in accordance with current EPA-approved procedures?

Yes.

e. If any non-EPA preservation methods were used, list the source(s) from which these methods were derived:

Not applicable.

f. Were sample containers pre-preserved or were preservatives added in the field?

All of the sample containers that needed chemical preservation were pre-preserved.

g. Were the sample containers labeled?

Yes.

h. Do the sample labels provide the following information:

Sample identification number?	*Yes*
Well number?	*Yes*
Name of collector?	*Yes*
Date and time of collection?	*Yes*
Facility name?	*Yes*
Parameter analyses requested?	*Yes*

i. Do the sample labels remain legible when wet?

Yes, they are covered with wide transparent tape.

j. Is a chain-of-custody record included with each sample?

Yes.

k. Does the chain-of-custody record document the following:

Sample identification number?	*Yes*
Well number?	*Yes*
Signature of collector?	*Yes*
Date and time of collection?	*Yes*
Sample container and preservative type?	*Yes*
Number of containers?	*Yes*
Parameter analyses requested?	*Yes*
Signature of all persons involved in the chain-of-possession?	*Yes*
Inclusive dates of possession?	*Yes*

l. Was the headspace completely eliminated from containers used to collect samples for volatile organic analyses?

Yes.

m. Is at least one trip blank prepared for each sample container type to verify sample container cleanliness and field handling methods?

No.

n. If no to m, were any trip blanks prepared?

Yes.

o. If yes to n, in what containers and how many?

A trip blank was collected for volatile organics only. A trip blank was included with each cooler shipped to the lab.

p. What type of laboratory is used for the sample analyses (e.g. on-site in-house, off-site in-house, off-site contractor)?

An off-site contractor is used for sample analyses.

q. How are the samples maintained prior to analyses (i.e., refrigerated, secured, etc.)?

The samples are kept cold in coolers and shipped to a contract laboratory at the end of each day.

r. How long are the samples held prior to transport to the laboratory?

The samples are shipped to a laboratory at the end of each day.

s. How are the samples transported/shipped to the laboratory (i.e., hand delivered, overnight express, etc.)?

The samples are shipped overnight to the laboratory via Federal Express.

t. If the samples are not hand delivered, are sample seals attached to the containers or coolers to ensure that the samples are not tampered with while in transit?

Each cooler is wrapped with strapping tape and sealed with a custody seal for shipment.

6. Quality Assurance/Quality Control

In completing this portion of the O & M Field Audit checklist, the HWP feels that the auditor should contact the responsible laboratory directly for a response to the following questions, realizing that the resulting response must be taken as fact. This procedure is recommended since the O & M Field Audit is not intended as a laboratory audit, but the overall content of the report would not be complete without the answers to the following (answers are written verbatim as received from the lab):

a. Are laboratory logbooks maintained to track all phases of laboratory procedure from sample receipt through analysis, reporting, and disposition?

Yes.

b. Do the logbooks document the following:

Client name?	*Yes*
Date and time of sample receipt?	*Yes*
Sample number and analysis to be performed?	*Yes*
Observation of damaged/irregular samples received?	*Yes*
Sample preparation methods (e.g. extraction)?	*Yes*
Date and time of sample analysis initiation and completion?	*Yes*
Name of person performing each analytical step?	*Yes*
All QA/QC sample results?	*Yes*
Instrument calibration information?	*Yes*

c. Describe all procedures used to ensure integrity of the samples in the laboratory prior to analysis:

Internal chain-of-custody, secondary data review, formal standard operating procedures, refrigerated storage spaces, etc.

d. Are all samples analyzed within EPA-specified holding times (e.g. SW-846)?

Yes, if possible.

e. If no to d, are holding time overruns reported on the final analysis results sheets?

Yes.

f. Are all samples analyzed using an EPA-approved analytical method for each parameter?

Yes.

g. Is the analytical method used for each parameter documented?

Yes.

h. If a new analytical method is used, is it documented, with split samples analyzed using the old method for comparison purposes?

Yes.

i. If any non-EPA analytical methods are commonly used, list the method(s) and their source document(s):

RSK-175, NCASI 99.01, NCASI 94.03

j. For replicate analyses (e.g. TOC, TOX), describe the lab method used to obtain the individual concentration values:

Prepare and analyze samples in replicates. Separate results provided for each replicate unless requested to provide average result.

k. Are appropriate QA/QC measures used in laboratory analyses (e.g. blanks, matrix spikes, standards, etc.)?

Yes.

1. Are detection limits and percent recovery for matrix spikes or controls reported for each sample parameter?

   Yes.

APPENDIX B

Analytical Results

Solutia, Incorporated
March 2-3, 2005

Missouri Department of Natural Resources

Environmental Services Program

Order ID: 050303001 **Program, Contact:** HWP, Joe Gassner

Report Date: 4/14/2005 **LDPR:** QERPM/NJ00SOLU

Order Comment:

Sample: 050303001-01 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502372 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 9:30 AM

Matrix: Nonpotable Water **Sample Comment:** Trip blank

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	1,2,4-Trichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,2-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,3-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,4-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,5-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,6-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dichlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dimethylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrotoluene	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,6-Dinitrotoluene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chloronaphthalene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methyl-4,6-dinitrophenol	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylnaphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitrophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3,3-Dichlorobenzidine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Bromophenyl phenyl ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloro-3-methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chlorophenyl phenyl ether	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Methylphenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C

Date Printed: 4/14/2005

Sample: 050303001-01 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502372 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 9:30 AM

Matrix: Nonpotable Water **Sample Comment:** Trip blank

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	4-Nitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	azobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(b)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(ghi)perylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(k)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzoic Acid	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethoxy)methane	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-chloroisopropyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Ethylhexyl) phthalate	13.8		ug/L	Q50321-04bna	8270C
BNAs	Butyl benzyl phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Chrysene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzo(a,h)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzofuran	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Diethyl phthalate	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Dimethyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-butyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-octyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluorene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorocyclopentadiene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachloroethane	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Indeno(1,2,3-cd)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Isophorone	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Naphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Nitrobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitroso-di-n-propylamine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitrosodiphenylamine	25.0	ND	ug/L	Q50321-04bna	8270C

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Sample: 050303001-01 Facility ID: Site: Solutia, Inc - Queeny Plant

Customer # : 0502372 County: St. Louis City Collect Date: 3/2/2005

Collector: Eric Sappington Affiliation: ESP Collect Time: 9:30 AM

Matrix: Nonpotable Water **Sample Comment:** Trip blank

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	Pentachlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenanthrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
VOAs	1,1,1,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,1-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropanone	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,3-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,3-Trichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,4-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,4-Trimethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dibromo-3-chloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dibromoethane (EDB)	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3,5-Trimethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3-Dichlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,4-Dichlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1-Chorobutane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Butanone (MEK)	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Hexanone	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Nitropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	4-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	4-Methyl-2-pentanone(MIBK)	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	acetone	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Acrylonitrile	1.00	ND	ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-01 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502372 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 9:30 AM

Matrix: Nonpotable Water **Sample Comment:** Trip blank

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
/OAs	Allyl Chloride	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Benzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromodichloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromoform	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	carbon disulfide	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Carbon Tetrachloride	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Chloroacetonitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
/OAs	Chlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Chloroethane	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Chloroform	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Chloromethane	10.0	ND	ug/L	Q50309-02VOA	8260B
/OAs	cis-1,2-dichloroethene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	cis-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Dibromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Dibromomethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Dichlorodifluoromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Diethyl ether	10.0	ND	ug/L	Q50309-02VOA	8260B
/OAs	Ethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Ethylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50309-02VOA	8260B
/OAs	Hexachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Iodomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Isopropylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	m&p-Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methacrylonitrile	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methyl Acrylate	5.00	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methylene chloride	10.0	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methyl-t-butyl ether	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Naphthalene	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	n-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Nitrobenzene	5.00	ND	ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-01 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502372 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 9:30 AM

Matrix: Nonpotable Water | **Sample Comment:** Trip blank

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	n-Propylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	o-Xylene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Pentachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	p-isopropyltoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Propionitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	sec-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Styrene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	tert-Butylbenzene	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Tetrachloroethene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Tetrahydrofuran	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Toluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Total Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	trans-1,2-Dichloroethene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	trans-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	trans-1,4-Dichloro-2-butene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Trichloroethene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Trichlorofluoromethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Vinyl Chloride	0.50	ND	ug/L	Q50309-02VOA	8260B

Sample: 050303001-02 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502373 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 9:45 AM

Matrix: Nonpotable Water | **Sample Comment:** MW-3 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
Arsenic-Total in Water	Arsenic	9.52		ug/L		SW 846 6020 (ICP-MS)
BNAs	1,2,4-Trichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,2-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,3-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,4-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,5-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,6-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dichlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dimethylphenol	1.00	ND	ug/L	Q50321-04bna	8270C

Sample: 050303001-02 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502373 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 9:45 AM

Matrix: Nonpotable Water | **Sample Comment:** MW-3 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	2,4-Dinitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrotoluene	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,6-Dinitrotoluene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chloronaphthalene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methyl-4,6-dinitrophenol	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylnaphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitrophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3,3-Dichlorobenzidine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Bromophenyl phenyl ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloro-3-methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chlorophenyl phenyl ether	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Methylphenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	azobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(b)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(ghi)perylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(k)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzoic Acid	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethoxy)methane	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-chloroisopropyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Ethylhexyl) phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Butyl benzyl phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Chrysene	1.00	ND	ug/L	Q50321-04bna	8270C

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Sample: 050303001-02 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502373 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 9:45 AM

Matrix: Nonpotable Water **Sample Comment:** MW-3 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	Dibenzo(a,h)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzofuran	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Diethyl phthalate	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Dimethyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-butyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-octyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluorene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorocyclopentadiene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachloroethane	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Indeno(1,2,3-cd)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Isophorone	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Naphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Nitrobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitroso-di-n-propylamine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitrosodiphenylamine	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Pentachlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenanthrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
Field pH	pH	6.60		pH Units		EPA 150.1
Field Specific Conductivity	Specific Conductivity	7750		umhos/cm		SM 2510
Lead-Total in Water	Lead	23.7		ug/L		SW 846 6020 (ICP-MS)
Temperature	Temperature	15.5		degrees C		EPA 170.1
VOAs	1,1,1,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,1-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethene	1.16		ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropanone	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,3-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-02 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502373 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 9:45 AM

Matrix: Nonpotable Water **Sample Comment:** MW-3 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
/OAs	1,2,3-Trichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,2,4-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,2,4-Trimethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,2-Dibromo-3-chloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,2-Dibromoethane (EDB)	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,2-Dichlorobenzene	0.77	05	ug/L	Q50309-02VOA	8260B
/OAs	1,2-Dichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,3,5-Trimethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,3-Dichlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,3-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1,4-Dichlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	1-Chorobutane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	2,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	2-Butanone (MEK)	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	2-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	2-Hexanone	1.00	ND	ug/L	Q50309-02VOA	8260B
/OAs	2-Nitropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	4-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	4-Methyl-2-pentanone(MIBK)	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	acetone	10.0	ND	ug/L	Q50309-02VOA	8260B
/OAs	Acrylonitrile	1.00	ND	ug/L	Q50309-02VOA	8260B
/OAs	Allyl Chloride	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Benzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromodichloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromoform	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Bromomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	carbon disulfide	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Carbon Tetrachloride	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Chloroacetonitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
/OAs	Chlorobenzene	34.3		ug/L	Q50309-02VOA	8260B
/OAs	Chloroethane	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Chloroform	0.50	ND	ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-02 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502373 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 9:45 AM

Matrix: Nonpotable Water | **Sample Comment:** MW-3 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	Chloromethane	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	cis-1,2-dichloroethene	802	09	ug/L	Q50309-02VOA	8260B
VOAs	cis-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dibromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dibromomethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dichlorodifluoromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Diethyl ether	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Ethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Ethylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Hexachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Iodomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Isopropylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	m&p-Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methacrylonitrile	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methyl Acrylate	5.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methylene chloride	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methyl-t-butyl ether	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Naphthalene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	n-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Nitrobenzene	5.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	n-Propylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	o-Xylene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Pentachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	p-isopropyltoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Propionitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	sec-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Styrene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	tert-Butylbenzene	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Tetrachloroethene	838	09	ug/L	Q50309-02VOA	8260B
VOAs	Tetrahydrofuran	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Toluene	0.73	05	ug/L	Q50309-02VOA	8260B
VOAs	Total Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	trans-1,2-Dichloroethene	13.2		ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-02 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502373 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 9:45 AM

Matrix: Nonpotable Water | **Sample Comment:** MW-3 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
/OAs	trans-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	trans-1,4-Dichloro-2-butene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Trichloroethene	326	09	ug/L	Q50309-02VOA	8260B
/OAs	Trichlorofluoromethane	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Vinyl Chloride	19.2		ug/L	Q50309-02VOA	8260B

Sample: 050303001-03 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502374 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 11:50 AM

Matrix: Nonpotable Water | **Sample Comment:** Rec-4 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
rsenic-Total in Water	Arsenic	4.59	05	ug/L		SW 846 6020 (ICP-MS)
BNAs	1,2,4-Trichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,2-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,3-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,4-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,5-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,6-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dichlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dimethylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrotoluene	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,6-Dinitrotoluene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chloronaphthalene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methyl-4,6-dinitrophenol	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylnaphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitrophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3,3-Dichlorobenzidine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Bromophenyl phenyl ether	1.00	ND	ug/L	Q50321-04bna	8270C

Sample: 050303001-03 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502374 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 11:50 AM

Matrix: Nonpotable Water **Sample Comment:** Rec-4 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	4-Chloro-3-methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloroaniline	1310	09	ug/L	Q50321-04bna	8270C
BNAs	4-Chlorophenyl phenyl ether	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Methylphenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	azobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(b)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(ghi)perylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(k)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzoic Acid	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethoxy)methane	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-chloroisopropyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Ethylhexyl) phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Butyl benzyl phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Chrysene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzo(a,h)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzofuran	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Diethyl phthalate	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Dimethyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-butyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-octyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluorene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorocyclopentadiene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachloroethane	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Indeno(1,2,3-cd)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C

Date Printed: 4/14/2005

Sample: 050303001-03 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502374 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 11:50 AM

Matrix: Nonpotable Water | **Sample Comment:** Rec-4 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	Isophorone	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Naphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Nitrobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitroso-di-n-propylamine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitrosodiphenylamine	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Pentachlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenanthrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
Field pH	pH	6.60		pH Units		EPA 150.1
Field Specific Conductivity	Specific Conductivity	3280		umhos/cm		SM 2510
Lead-Total in Water	Lead	1.54		ug/L		SW 846 6020 (ICP-MS)
Temperature	Temperature	17.5		degrees C		EPA 170.1
VOAs	1,1,1,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,1-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethane	0.95	05	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethene	6.19		ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropanone	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,3-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,3-Trichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,4-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,4-Trimethylbenzene	0.56	05	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dibromo-3-chloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dibromoethane (EDB)	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichlorobenzene	6.14		ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3,5-Trimethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3-Dichlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,4-Dichlorobenzene	3.76		ug/L	Q50309-02VOA	8260B
VOAs	1-Chorobutane	0.50	ND	ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-03 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502374 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 11:50 AM

Matrix: Nonpotable Water **Sample Comment:** Rec-4 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	2,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Butanone (MEK)	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Hexanone	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Nitropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	4-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	4-Methyl-2-pentanone(MIBK)	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	acetone	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Acrylonitrile	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Allyl Chloride	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Benzene	4.88		ug/L	Q50309-02VOA	8260B
VOAs	Bromobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromodichloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromoform	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	carbon disulfide	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Carbon Tetrachloride	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chloroacetonitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chlorobenzene	610	09	ug/L	Q50309-02VOA	8260B
VOAs	Chloroethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chloroform	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chloromethane	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	cis-1,2-dichloroethene	1570	09	ug/L	Q50309-02VOA	8260B
VOAs	cis-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dibromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dibromomethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dichlorodifluoromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Diethyl ether	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Ethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Ethylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Hexachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Iodomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Isopropylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B

Sample: 050303001-03 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502374 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 11:50 AM

Matrix: Nonpotable Water | **Sample Comment:** Rec-4 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
/OAs	m&p-Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methacrylonitrile	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methyl Acrylate	5.00	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methylene chloride	10.0	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Methyl-t-butyl ether	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Naphthalene	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	n-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Nitrobenzene	5.00	ND	ug/L	Q50309-02VOA	8260B
/OAs	n-Propylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	o-Xylene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Pentachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	p-isopropyltoluene	1.70		ug/L	Q50309-02VOA	8260B
/OAs	Propionitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
/OAs	sec-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Styrene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	tert-Butylbenzene	1.00	ND	ug/L	Q50309-02VOA	8260B
/OAs	Tetrachloroethene	3050	09	ug/L	Q50309-02VOA	8260B
/OAs	Tetrahydrofuran	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Toluene	3.30		ug/L	Q50309-02VOA	8260B
/OAs	Total Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	trans-1,2-Dichloroethene	47.1		ug/L	Q50309-02VOA	8260B
/OAs	trans-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	trans-1,4-Dichloro-2-butene	0.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Trichloroethene	5810	09	ug/L	Q50309-02VOA	8260B
/OAs	Trichlorofluoromethane	2.50	ND	ug/L	Q50309-02VOA	8260B
/OAs	Vinyl Chloride	76.0		ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-04 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502375 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 2:25 PM

Matrix: Nonpotable Water | **Sample Comment:** Rec-1 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
Arsenic-Total in Water	Arsenic	8.58		ug/L		SW 846 6020 (ICP-MS)
BNAs	1,2,4-Trichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,2-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,3-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,4-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,5-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,6-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dichlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dimethylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrotoluene	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,6-Dinitrotoluene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chloronaphthalene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methyl-4,6-dinitrophenol	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylnaphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitrophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3,3-Dichlorobenzidine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Bromophenyl phenyl ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloro-3-methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chlorophenyl phenyl ether	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Methylphenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	azobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(b)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C

Date Printed: 4/14/2005

Sample: 050303001-04 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502375 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 2:25 PM

Matrix: Nonpotable Water **Sample Comment:** Rec-1 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	Benzo(ghi)perylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(k)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzoic Acid	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethoxy)methane	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-chloroisopropyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Ethylhexyl) phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Butyl benzyl phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Chrysene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzo(a,h)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzofuran	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Diethyl phthalate	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Dimethyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-butyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-octyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluorene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorocyclopentadiene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachloroethane	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Indeno(1,2,3-cd)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Isophorone	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Naphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Nitrobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitroso-di-n-propylamine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitrosodiphenylamine	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Pentachlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenanthrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
ield pH	pH	7.50		pH Units		EPA 150.1
ield Specific Conductivity	Specific Conductivity	1080		umhos/cm		SM 2510
ead-Total in Water	Lead	17.0		ug/L		SW 846 6020 (ICP-MS)
emperature	Temperature	15.6		degrees C		EPA 170.1

Date Printed: 4/14/2005

Sample: 050303001-04 | **Facility ID:** | **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502375 | **County:** St. Louis City | **Collect Date:** 3/2/2005

Collector: Eric Sappington | **Affiliation:** ESP | **Collect Time:** 2:25 PM

Matrix: Nonpotable Water | **Sample Comment:** Rec-1 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	1,1,1,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,1-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropanone	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,3-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,3-Trichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,4-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,4-Trimethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dibromo-3-chloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dibromoethane (EDB)	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichlorobenzene	31.5		ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3,5-Trimethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3-Dichlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,4-Dichlorobenzene	1.13		ug/L	Q50309-02VOA	8260B
VOAs	1-Chorobutane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Butanone (MEK)	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Hexanone	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Nitropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	4-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	4-Methyl-2-pentanone(MIBK)	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	acetone	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Acrylonitrile	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Allyl Chloride	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Benzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B

Sample: 050303001-04 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502375 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 2:25 PM

Matrix: Nonpotable Water **Sample Comment:** Rec-1 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	Bromodichloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromoform	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	carbon disulfide	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Carbon Tetrachloride	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chloroacetonitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chlorobenzene	211	09	ug/L	Q50309-02VOA	8260B
VOAs	Chloroethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chloroform	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chloromethane	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	cis-1,2-dichloroethene	49.8		ug/L	Q50309-02VOA	8260B
VOAs	cis-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dibromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dibromomethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dichlorodifluoromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Diethyl ether	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Ethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Ethylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Hexachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Iodomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Isopropylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	m&p-Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methacrylonitrile	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methyl Acrylate	5.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methylene chloride	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methyl-t-butyl ether	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Naphthalene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	n-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Nitrobenzene	5.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	n-Propylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	o-Xylene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Pentachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	p-isopropyltoluene	1.49		ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-04 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502375 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 2:25 PM

Matrix: Nonpotable Water **Sample Comment:** Rec-1 Monitoring well,groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	Propionitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	sec-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Styrene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	tert-Butylbenzene	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Tetrachloroethene	5710	09	ug/L	Q50309-02VOA	8260B
VOAs	Tetrahydrofuran	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Toluene	1.87		ug/L	Q50309-02VOA	8260B
VOAs	Total Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	trans-1,2-Dichloroethene	0.57	05	ug/L	Q50309-02VOA	8260B
VOAs	trans-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	trans-1,4-Dichloro-2-butene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Trichloroethene	298	09	ug/L	Q50309-02VOA	8260B
VOAs	Trichlorofluoromethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Vinyl Chloride	0.50	ND	ug/L	Q50309-02VOA	8260B

Sample: 050303001-05 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502376 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:**

Matrix: Nonpotable Water **Sample Comment:** Blind duplicate - groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
Arsenic-Total in Water	Arsenic	4.45	05	ug/L		SW 846 6020 (ICP-MS)
BNAs	1,2,4-Trichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,2-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,3-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,4-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,5-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,6-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dichlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dimethylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrotoluene	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,6-Dinitrotoluene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chloronaphthalene	5.00	ND	ug/L	Q50321-04bna	8270C

Date Printed: 4/14/2005

Sample: 050303001-05 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502376 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:**

Matrix: Nonpotable Water **Sample Comment:** Blind duplicate - groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	2-Chlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methyl-4,6-dinitrophenol	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylnaphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitrophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3,3-Dichlorobenzidine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Bromophenyl phenyl ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloro-3-methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloroaniline	948	09	ug/L	Q50321-04bna	8270C
BNAs	4-Chlorophenyl phenyl ether	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Methylphenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	azobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(b)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(ghi)perylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(k)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzoic Acid	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethoxy)methane	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-chloroisopropyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Ethylhexyl) phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Butyl benzyl phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Chrysene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzo(a,h)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzofuran	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Diethyl phthalate	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Dimethyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C

Date Printed: 4/14/2005

Sample: 050303001-05 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502376 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:**

Matrix: Nonpotable Water **Sample Comment:** Blind duplicate - groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	Di-n-butyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-octyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluorene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorocyclopentadiene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachloroethane	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Indeno(1,2,3-cd)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Isophorone	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Naphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Nitrobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitroso-di-n-propylamine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitrosodiphenylamine	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Pentachlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenanthrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
Lead-Total in Water	Lead	1.47		ug/L		SW 846 6020 (ICP-MS)
VOAs	1,1,1,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,1-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2,2-Tetrachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1,2-Trichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethane	0.89	05	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloroethene	6.65		ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropanone	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,1-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,3-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,3-Trichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,4-Trichlorobenzene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2,4-Trimethylbenzene	0.51	05	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dibromo-3-chloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dibromoethane (EDB)	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichlorobenzene	7.14		ug/L	Q50309-02VOA	8260B
VOAs	1,2-Dichloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B

Sample: 050303001-05 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502376 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:**

Matrix: Nonpotable Water **Sample Comment:** Blind duplicate - groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	1,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3,5-Trimethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3-Dichlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,3-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1,4-Dichlorobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	1-Chorobutane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2,2-Dichloropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Butanone (MEK)	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Hexanone	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	2-Nitropropane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	4-Chlorotoluene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	4-Methyl-2-pentanone(MIBK)	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	acetone	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Acrylonitrile	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Allyl Chloride	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Benzene	5.24		ug/L	Q50309-02VOA	8260B
VOAs	Bromobenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromodichloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromoform	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Bromomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	carbon disulfide	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Carbon Tetrachloride	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chloroacetonitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chlorobenzene	542	09	ug/L	Q50309-02VOA	8260B
VOAs	Chloroethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chloroform	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Chloromethane	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	cis-1,2-dichloroethene	1500	09	ug/L	Q50309-02VOA	8260B
VOAs	cis-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dibromochloromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dibromomethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Dichlorodifluoromethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Diethyl ether	10.0	ND	ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-05 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502376 **County:** St. Louis City **Collect Date:** 3/2/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:**

Matrix: Nonpotable Water **Sample Comment:** Blind duplicate - groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	Ethylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Ethylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Hexachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Iodomethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Isopropylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	m&p-Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methacrylonitrile	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methyl Acrylate	5.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methylene chloride	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methylmethacrylate	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Methyl-t-butyl ether	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Naphthalene	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	n-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Nitrobenzene	5.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	n-Propylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	o-Xylene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Pentachloroethane	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	p-isopropyltoluene	1.67		ug/L	Q50309-02VOA	8260B
VOAs	Propionitrile	10.0	ND	ug/L	Q50309-02VOA	8260B
VOAs	sec-Butylbenzene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Styrene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	tert-Butylbenzene	1.00	ND	ug/L	Q50309-02VOA	8260B
VOAs	Tetrachloroethene	2880	09	ug/L	Q50309-02VOA	8260B
VOAs	Tetrahydrofuran	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Toluene	3.29		ug/L	Q50309-02VOA	8260B
VOAs	Total Xylenes	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	trans-1,2-Dichloroethene	49.1		ug/L	Q50309-02VOA	8260B
VOAs	trans-1,3-Dichloropropene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	trans-1,4-Dichloro-2-butene	0.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Trichloroethene	5670	09	ug/L	Q50309-02VOA	8260B
VOAs	Trichlorofluoromethane	2.50	ND	ug/L	Q50309-02VOA	8260B
VOAs	Vinyl Chloride	75.2		ug/L	Q50309-02VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-06 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502377 **County:** St. Louis City **Collect Date:** 3/3/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 8:00 AM

Matrix: Nonpotable Water **Sample Comment:** LPZ-5 Monitoring well, groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
Arsenic-Total in Water	Arsenic	165	09	ug/L		SW 846 6020 (ICP-MS)
BNAs	1,2,4-Trichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,2-Dichlorobenzene	19.7		ug/L	Q50321-04bna	8270C
BNAs	1,3-Dichlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	1,4-Dichlorobenzene	15.1		ug/L	Q50321-04bna	8270C
BNAs	2,4,5-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4,6-Trichlorophenol	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dichlorophenol	6.02		ug/L	Q50321-04bna	8270C
BNAs	2,4-Dimethylphenol	53.8		ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,4-Dinitrotoluene	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2,6-Dinitrotoluene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chloronaphthalene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Chlorophenol	79.1		ug/L	Q50321-04bna	8270C
BNAs	2-Methyl-4,6-dinitrophenol	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylnaphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Methylphenol	92.4		ug/L	Q50321-04bna	8270C
BNAs	2-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	2-Nitrophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3,3-Dichlorobenzidine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	3-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Bromophenyl phenyl ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloro-3-methylphenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Chloroaniline	12900	09	ug/L	Q50321-04bna	8270C
BNAs	4-Chlorophenyl phenyl ether	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Methylphenol	109		ug/L	Q50321-04bna	8270C
BNAs	4-Nitroaniline	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	4-Nitrophenol	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Acenaphthylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	azobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(a)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(b)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C

Date Printed: 4/14/2005

Sample: 050303001-06 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502377 **County:** St. Louis City **Collect Date:** 3/3/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 8:00 AM

Matrix: Nonpotable Water **Sample Comment:** LPZ-5 Monitoring well, groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
BNAs	Benzo(ghi)perylene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzo(k)fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Benzoic Acid	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethoxy)methane	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Chloroethyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-chloroisopropyl)ether	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	bis(2-Ethylhexyl) phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Butyl benzyl phthalate	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Chrysene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzo(a,h)anthracene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Dibenzofuran	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Diethyl phthalate	10.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Dimethyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Di-n-butyl phthalate	11.7		ug/L	Q50321-04bna	8270C
BNAs	Di-n-octyl phthalate	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluoranthene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Fluorene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorobutadiene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachlorocyclopentadiene	5.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Hexachloroethane	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Indeno(1,2,3-cd)pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Isophorone	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Naphthalene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Nitrobenzene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitroso-di-n-propylamine	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	n-Nitrosodiphenylamine	25.0	ND	ug/L	Q50321-04bna	8270C
BNAs	Pentachlorophenol	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenanthrene	1.00	ND	ug/L	Q50321-04bna	8270C
BNAs	Phenol	253	09	ug/L	Q50321-04bna	8270C
BNAs	Pyrene	1.00	ND	ug/L	Q50321-04bna	8270C
Field pH	pH	7.28		pH Units		EPA 150.1
Field Specific Conductivity	Specific Conductivity	2970		umhos/cm		SM 2510
Lead-Total in Water	Lead	1.41		ug/L		SW 846 6020 (ICP-MS)
Temperature	Temperature	13.3		degrees C		EPA 170.1

Date Printed: 4/14/2005

Sample: 050303001-06 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502377 **County:** St. Louis City **Collect Date:** 3/3/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 8:00 AM

Matrix: Nonpotable Water **Sample Comment:** LPZ-5 Monitoring well, groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	1,1,1,2-Tetrachloroethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,1,1-Trichloroethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,1,2,2-Tetrachloroethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,1,2-Trichloroethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,1-Dichloroethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,1-Dichloroethene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,1-Dichloropropanone	100	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,1-Dichloropropene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,2,3-Trichlorobenzene	250	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,2,3-Trichloropropane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,2,4-Trichlorobenzene	250	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,2,4-Trimethylbenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,2-Dibromo-3-chloropropane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,2-Dibromoethane (EDB)	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,2-Dichlorobenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,2-Dichloroethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,2-Dichloropropane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,3,5-Trimethylbenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,3-Dichlorobenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,3-Dichloropropane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1,4-Dichlorobenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	1-Chorobutane	62.6	09, 05	ug/L	Q50309-03VOA	8260B
VOAs	2,2-Dichloropropane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	2-Butanone (MEK)	250	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	2-Chlorotoluene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	2-Hexanone	100	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	2-Nitropropane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	4-Chlorotoluene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	4-Methyl-2-pentanone(MIBK)	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	acetone	1000	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Acrylonitrile	100	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Allyl Chloride	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Benzene	129	09	ug/L	Q50309-03VOA	8260B
VOAs	Bromobenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Bromochloromethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-06 Facility ID: Site: Solutia, Inc - Queeny Plant

Customer # : 0502377 County: St. Louis City Collect Date: 3/3/2005

Collector: Eric Sappington Affiliation: ESP Collect Time: 8:00 AM

Matrix: Nonpotable Water **Sample Comment:** LPZ-5 Monitoring well, groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	Bromodichloromethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Bromoform	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Bromomethane	250	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	carbon disulfide	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Carbon Tetrachloride	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Chloroacetonitrile	1000	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Chlorobenzene	7510	09	ug/L	Q50309-03VOA	8260B
VOAs	Chloroethane	250	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Chloroform	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Chloromethane	1000	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	cis-1,2-dichloroethene	154	09	ug/L	Q50309-03VOA	8260B
VOAs	cis-1,3-Dichloropropene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Dibromochloromethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Dibromomethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Dichlorodifluoromethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Diethyl ether	1000	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Ethylbenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Ethylmethacrylate	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Hexachlorobutadiene	100	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Hexachloroethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Iodomethane	250	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Isopropylbenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	m&p-Xylenes	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Methacrylonitrile	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Methyl Acrylate	500	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Methylene chloride	1000	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Methylmethacrylate	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Methyl-t-butyl ether	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Naphthalene	250	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	n-Butylbenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Nitrobenzene	500	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	n-Propylbenzene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	o-Xylene	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	Pentachloroethane	50.0	09, ND	ug/L	Q50309-03VOA	8260B
VOAs	p-isopropyltoluene	50.0	09, ND	ug/L	Q50309-03VOA	8260B

Date Printed: 4/14/2005

Sample: 050303001-06 **Facility ID:** **Site:** Solutia, Inc - Queeny Plant

Customer # : 0502377 **County:** St. Louis City **Collect Date:** 3/3/2005

Collector: Eric Sappington **Affiliation:** ESP **Collect Time:** 8:00 AM

Matrix: Nonpotable Water **Sample Comment:** LPZ-5 Monitoring well, groundwater

Test	Parameter	Result	Qualifier	Units	QC BatchID	Method
VOAs	Propionitrile	1000	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	sec-Butylbenzene	50.0	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	Styrene	50.0	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	tert-Butylbenzene	100	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	Tetrachloroethene	394	**09**	ug/L	Q50309-03VOA	8260B
VOAs	Tetrahydrofuran	250	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	Toluene	32900	**09**	ug/L	Q50309-03VOA	8260B
VOAs	Total Xylenes	50.0	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	trans-1,2-Dichloroethene	50.0	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	trans-1,3-Dichloropropene	50.0	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	trans-1,4-Dichloro-2-butene	50.0	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	Trichloroethene	181	**09**	ug/L	Q50309-03VOA	8260B
VOAs	Trichlorofluoromethane	250	**09, ND**	ug/L	Q50309-03VOA	8260B
VOAs	Vinyl Chloride	50.0	**09, ND**	ug/L	Q50309-03VOA	8260B

The analysis of this sample was performed in accordance with procedures approved or recognized by the U.S. Environmental Protection Agency.

Qualifier Descriptions

01 Improper collection method	11 Estimated value, matrix interference
02 Improper preservation	12 Insufficient quantity
03 Exceeded holding time	13 Estimated value, true result is > reported value
04 Analyzed by Contract Laboratory	14 Estimated value, non-homogeneous sample
05 Estimated value, detected below PQL	15 No Result - Failed Quality Controls Requirements
06 Estimated value, QC data outside limits	16 Not analyzed - related analyte not detected
07 Estimated value, analyte outside calibration range	17 Results in dry weight
08 Analyte present in blank at > 1/2 reported value	18 Sample pH is outside the acceptable range
09 Sample was diluted during analysis	ND Not detected at reported value
10 Laboratory error	

Earl Pabst

Earl Pabst, Program Director
Environmental Services Program
Air and Land Protection Division

Date Printed: 4/14/2005

APPENDIX F

LABORATORY ANALYTICAL DATA

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: LPZ-5

Lab Name: STL Savannah Job No.: 1125

SDG No.: QCM14

Matrix: (soil/water) Water Lab Sample ID: 680-1125-1

Sample wt/vol: 5 (g/mL) Lab File ID: o5503.d

Level: (low/med) Date Received: 03/04/05

% Moisture: not dec. Date Analyzed: 03/17/05

GC Column: ID: (mm) Dilution Factor: 500

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
78-93-3	2-Butanone (MEK)	<5000	
124-48-1	Dibromochloromethane	<500	
108-10-1	4-Methyl-2-pentanone (MIBK)	<5000	
67-64-1	Acetone	<13000	
71-43-2	Benzene	<500	
75-27-4	Bromodichloromethane	<500	
75-25-2	Bromoform	<500	
75-15-0	Carbon disulfide	<500	
56-23-5	Carbon tetrachloride	<500	
108-90-7	Chlorobenzene	9100	
67-66-3	Chloroform	<500	
74-87-3	Chloromethane	<500	
156-59-2	cis-1,2-Dichloroethene	<500	
107-06-2	1,2-Dichloroethane	<500	
100-41-4	Ethylbenzene	<500	
97-63-2	Ethyl methacrylate	<500	
74-88-4	Iodomethane	<2500	
75-09-2	Methylene Chloride	<500	
127-18-4	Tetrachloroethene	<500	
108-88-3	Toluene	57000	
156-60-5	trans-1,2-Dichloroethene	<500	
71-55-6	1,1,1-Trichloroethane	<500	
79-01-6	Trichloroethene	<500	
75-01-4	Vinyl chloride	<500	
1330-20-7	Xylenes, Total	<1000	

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: LPZ-2

Lab Name: STL Savannah Job No.: 1125

SDG No.: QCM14

Matrix: (soil/water) Water Lab Sample ID: 680-1125-2

Sample wt/vol: 5 (g/mL) Lab File ID: o5505.d

Level: (low/med) Date Received: 03/04/05

% Moisture: not dec. Date Analyzed: 03/17/05

GC Column: ID: (mm) Dilution Factor: 50

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
78-93-3	2-Butanone (MEK)	<500	
124-48-1	Dibromochloromethane	<50	
108-10-1	4-Methyl-2-pentanone (MIBK)	<500	
67-64-1	Acetone	<1300	
71-43-2	Benzene	<50	
75-27-4	Bromodichloromethane	<50	
75-25-2	Bromoform	<50	
75-15-0	Carbon disulfide	<50	
56-23-5	Carbon tetrachloride	<50	
108-90-7	Chlorobenzene	37	J
67-66-3	Chloroform	<50	
74-87-3	Chloromethane	<50	
156-59-2	cis-1,2-Dichloroethene	110	
107-06-2	1,2-Dichloroethane	<50	
100-41-4	Ethylbenzene	<50	
97-63-2	Ethyl methacrylate	<50	
74-88-4	Iodomethane	<250	
75-09-2	Methylene Chloride	<50	
127-18-4	Tetrachloroethene	<50	
108-88-3	Toluene	4600	
156-60-5	trans-1,2-Dichloroethene	<50	
71-55-6	1,1,1-Trichloroethane	<50	
79-01-6	Trichloroethene	<50	
75-01-4	Vinyl chloride	110	
1330-20-7	Xylenes, Total	<100	

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Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: TB-1

Lab Name: STL Savannah Job No.: 1125

SDG No.: QCM14

Matrix: (soil/water) Water Lab Sample ID: 680-1125-3

Sample wt/vol: 5 (g/mL) Lab File ID: o5501.d

Level: (low/med) Date Received: 03/04/05

% Moisture: not dec. Date Analyzed: 03/17/05

GC Column: ID: (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
78-93-3	2-Butanone (MEK)	<10	
124-48-1	Dibromochloromethane	<1.0	
108-10-1	4-Methyl-2-pentanone (MIBK)	<10	
67-64-1	Acetone	<25	
71-43-2	Benzene	<1.0	
75-27-4	Bromodichloromethane	<1.0	
75-25-2	Bromoform	<1.0	
75-15-0	Carbon disulfide	<1.0	
56-23-5	Carbon tetrachloride	<1.0	
108-90-7	Chlorobenzene	<1.0	
67-66-3	Chloroform	<1.0	
74-87-3	Chloromethane	<1.0	
156-59-2	cis-1,2-Dichloroethene	<1.0	
107-06-2	1,2-Dichloroethane	<1.0	
100-41-4	Ethylbenzene	<1.0	
97-63-2	Ethyl methacrylate	<1.0	
74-88-4	Iodomethane	<5.0	
75-09-2	Methylene Chloride	<1.0	
127-18-4	Tetrachloroethene	<1.0	
108-88-3	Toluene	<1.0	
156-60-5	trans-1,2-Dichloroethene	<1.0	
71-55-6	1,1,1-Trichloroethane	<1.0	
79-01-6	Trichloroethene	<1.0	
75-01-4	Vinyl chloride	<1.0	
1330-20-7	Xylenes, Total	<2.0	

Form 1
Dissolved Gases in Water

Client Sample ID: LPZ-5

Lab Name: STL Savannah

Job No.: 1125

SDG No.: QCM14

Matrix: (soil/water) Water

Lab Sample ID: 680-1125-1-RA PRIMARY

Sample wt/vol: _____ (g/mL) mL

Lab File ID: U078.D

% Moisture: _____ Decanted: (Y/N) ___

Date Received: 03/04/05

Extraction Method: _____

Date Extracted: _____

Concentrated Extract Volume: _____ (uL)

Date Analyzed: 03/07/05

Injection Volume: _____ (uL)

Dilution Factor: 1

GPC Cleanup: (Y/N) _____ pH: _____

Sulfur Cleanup: (Y/N) _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-84-0	Ethane	140	
74-85-1	Ethylene	8.7	
74-82-8	Methane	14000	

Form 1
Dissolved Gases in Water

Client Sample ID: LPZ-2

Lab Name: STL Savannah Job No.: 1125

SDG No.: QCM14

Matrix: (soil/water) Water Lab Sample ID: 680-1125-2-RA PRIMARY

Sample wt/vol: _____ (g/mL) mL Lab File ID: U079.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 03/04/05

Extraction Method: _____ Date Extracted: _____

Concentrated Extract Volume: _____ (uL) Date Analyzed: 03/07/05

Injection Volume: _____ (uL) Dilution Factor: 1

GPC Cleanup: (Y/N) _____ pH: _____ Sulfur Cleanup: (Y/N) _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-84-0	Ethane	57	
74-85-1	Ethylene	48	
74-82-8	Methane	17000	

General Chemistry

Client Sample ID: LPZ-5

Lab Sample ID: 680-1125-1
Client Matrix: Water

Date Sampled: 03/03/2005 0820
Date Received: 03/04/2005 0900

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Nitrogen, Nitrate	<0.050		mg/L	0.050	1.0	353.2	680-2561	03/04/2005 1226
Chloride	170		mg/L	2.0	2.0	325.2	680-5022	03/24/2005 1104
Total Organic Carbon	*40*		*mg/L*	*1.0*	*1.0*	*415.1*	*680-4292*	*03/18/2005 1229*

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Total Alkalinity as CaCO3	1300	J	mg/L	1.0	1.0	310.1	680-5554	03/29/2005 1310
Carbon dioxide (as CO2)	85		mg/L	1.0	1.0	310.1	680-5554	03/29/2005 1310
Sulfate	<5.0		mg/L	5.0	1.0	375.4	680-5377	03/29/2005 0844

ent Sample ID: LPZ-2

Lab Sample ID: 680-1125-2
Client Matrix: Water

Date Sampled: 03/03/2005 1015
Date Received: 03/04/2005 0900

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Nitrogen, Nitrate	<0.050	UJ	mg/L	0.050	1.0	353.2	680-2561	03/04/2005 1227
Chloride	63		mg/L	1.0	1.0	325.2	680-5022	03/24/2005 1046
Total Organic Carbon	*120*		*mg/L*	*1.0*	*1.0*	*415.1*	*680-4292*	*03/18/2005 1229*

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Total Alkalinity as CaCO3	980	J	mg/L	1.0	1.0	310.1	680-5554	03/29/2005 1310
Carbon dioxide (as CO2)	69		mg/L	1.0	1.0	310.1	680-5554	03/29/2005 1310
Sulfate	<25		mg/L	25	5.0	375.4	680-5377	03/29/2005 0846

Serial Number 31618

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

SEVERN TRENT **STL**

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location
Phone:
Fax:

PROJECT REFERENCE: Solutia Queeny FF	PROJECT NO.: 21561401.00002	PROJECT LOCATION (STATE): MO	
STL (LAB) PROJECT MANAGER: Lydia Guilizia	P.O. NUMBER	CONTRACT NO.	
(CLIENT (SITE) PM: Jeff Adams	CLIENT PHONE: 314-429-0100	CLIENT FAX: 314-429-0462	
CLIENT NAME: URS Corporation	CLIENT E-MAIL		
CLIENT ADDRESS: 1001 Highlands Plaza Drive W. Ste. 300 St. Louis, MO 63110			
COMPANY CONTRACTING THIS WORK (if applicable)			

PAGE 1 OF 1

STANDARD REPORT DELIVERY ○
DATE DUE
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE

NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	REQUIRED ANALYSIS: VOC's	Diss. Gases Ethane, Ethene, Methane	Nitrate	Nitrate, air, CO_2, Soy Chloride	TOC						REMARKS
								HCL	NONE	H_2SO_4	NONE	HCL						NUMBER OF CONTAINERS SUBMITTED
3-2-05	0935	MW-3		X				X	X	X	X	X						
3-2-05	1150	REC-4		X				X	X	X	X	X						
3-2-05	1150	REC-4-DUP		X				X	X	X	X	X						
3-2-05	1425	REC-1		X				X	X	X	X	X						
3-2-05	1345	REC-1-EB		X				X										
3-2-05	1600	TB-1		X				X										

TEMP 1.0

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
[signature]	3/2/05	15:50						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES ○ NO ○	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
[signature]	3/03/05	0915			680-1090	

2

STL8240-680 (12/02)

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: MW-3

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-1

Sample wt/vol: 5 (g/mL) mL Lab File ID: p4701.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/14/05

GC Column: ID: (mm) Dilution Factor: 10

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
78-93-3	2-Butanone (MEK)	<100	
124-48-1	Dibromochloromethane	<10	
108-10-1	Methyl isobutyl ketone (MIBK)	<100	
67-64-1	Acetone	<250	
71-43-2	Benzene	<10	
75-27-4	Bromodichloromethane	<10	
75-25-2	Bromoform	<10	
75-15-0	Carbon disulfide	<10	
56-23-5	Carbon tetrachloride	<10	
108-90-7	Chlorobenzene	27	
67-66-3	Chloroform	<10	
74-87-3	Chloromethane	<10	
156-59-2	cis-1,2-Dichloroethene	710	
107-06-2	1,2-Dichloroethane	<10	
100-41-4	Ethylbenzene	<10	
75-09-2	Methylene Chloride	<10	
127-18-4	Tetrachloroethene	530	
108-88-3	Toluene	<10	
156-60-5	trans-1,2-Dichloroethene	10	
71-55-6	1,1,1-Trichloroethane	<10	
79-01-6	Trichloroethene	200	
75-01-4	Vinyl chloride	<10	
1330-20-7	Xylenes, Total	<20	

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: MW-3

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-1 RA

Sample wt/vol: 5 (g/mL) mL Lab File ID: o5502.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/17/05

GC Column: ID: (mm) Dilution Factor: 10

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
97-63-2	Ethyl methacrylate	<10	
74-88-4	Iodomethane	<50	

RR

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: REC-4

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-2

Sample wt/vol: 5 (g/mL) mL Lab File ID: p4703.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/14/05

GC Column: ID: (mm) Dilution Factor: 100

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
78-93-3	2-Butanone (MEK)	<1000	
124-48-1	Dibromochloromethane	<100	
108-10-1	Methyl isobutyl ketone (MIBK)	<1000	
67-64-1	Acetone	<2500	
71-43-2	Benzene	<100	
75-27-4	Bromodichloromethane	<100	
75-25-2	Bromoform	<100	
75-15-0	Carbon disulfide	<100	
56-23-5	Carbon tetrachloride	<100	
108-90-7	Chlorobenzene	550	
67-66-3	Chloroform	<100	
74-87-3	Chloromethane	<100	
156-59-2	cis-1,2-Dichloroethene	1700	
107-06-2	1,2-Dichloroethane	<100	
100-41-4	Ethylbenzene	<100	
75-09-2	Methylene Chloride	<100	
127-18-4	Tetrachloroethene	2700	
108-88-3	Toluene	<100	
156-60-5	trans-1,2-Dichloroethene	<100	
71-55-6	1,1,1-Trichloroethane	<100	
79-01-6	Trichloroethene	5800	
75-01-4	Vinyl chloride	<100	
1330-20-7	Xylenes, Total	<200	

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: REC-4

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-2 RA

Sample wt/vol: 5 (g/mL) mL Lab File ID: o5504.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/17/05

GC Column: ID: (mm) Dilution Factor: 100

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
97-63-2	Ethyl methacrylate	<100	R
74-88-4	Iodomethane	<500	R

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: REC-4-DUP

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-3

Sample wt/vol: 5 (g/mL) mL Lab File ID: p4705.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/14/05

GC Column: ID: (mm) Dilution Factor: 100

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
78-93-3	2-Butanone (MEK)	<1000	
124-48-1	Dibromochloromethane	<100	
108-10-1	Methyl isobutyl ketone (MIBK)	<1000	
67-64-1	Acetone	<2500	
71-43-2	Benzene	<100	
75-27-4	Bromodichloromethane	<100	
75-25-2	Bromoform	<100	
75-15-0	Carbon disulfide	<100	
56-23-5	Carbon tetrachloride	<100	
108-90-7	Chlorobenzene	560	
67-66-3	Chloroform	<100	
74-87-3	Chloromethane	<100	
156-59-2	cis-1,2-Dichloroethene	1700	
107-06-2	1,2-Dichloroethane	<100	
100-41-4	Ethylbenzene	<100	
75-09-2	Methylene Chloride	<100	
127-18-4	Tetrachloroethene	2700	
108-88-3	Toluene	<100	
156-60-5	trans-1,2-Dichloroethene	<100	
71-55-6	1,1,1-Trichloroethane	<100	
79-01-6	Trichloroethene	5600	
75-01-4	Vinyl chloride	<100	
1330-20-7	Xylenes, Total	<200	

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: REC-4-DUP

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-3 RA

Sample wt/vol: 5 (g/mL) mL Lab File ID: o5506.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/17/05

GC Column: ID: (mm) Dilution Factor: 100

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q	
97-63-2	Ethyl methacrylate	<100		R
74-88-4	Iodomethane	<500		R

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: REC-1

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-4

Sample wt/vol: 5 (g/mL) mL Lab File ID: p4707.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/14/05

GC Column: ID: (mm) Dilution Factor: 100

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
78-93-3	2-Butanone (MEK)	<1000	
124-48-1	Dibromochloromethane	<100	
108-10-1	Methyl isobutyl ketone (MIBK)	<1000	
67-64-1	Acetone	<2500	
71-43-2	Benzene	<100	
75-27-4	Bromodichloromethane	<100	
75-25-2	Bromoform	<100	
75-15-0	Carbon disulfide	<100	
56-23-5	Carbon tetrachloride	<100	
108-90-7	Chlorobenzene	<100	
67-66-3	Chloroform	<100	
74-87-3	Chloromethane	<100	
156-59-2	cis-1,2-Dichloroethene	<100	
107-06-2	1,2-Dichloroethane	<100	
100-41-4	Ethylbenzene	<100	
75-09-2	Methylene Chloride	<100	
127-18-4	Tetrachloroethene	6400	
108-88-3	Toluene	<100	
156-60-5	trans-1,2-Dichloroethene	<100	
71-55-6	1,1,1-Trichloroethane	<100	
79-01-6	Trichloroethene	140	
75-01-4	Vinyl chloride	<100	
1330-20-7	Xylenes, Total	<200	

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: REC-1

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-4 RA

Sample wt/vol: 5 (g/mL) mL Lab File ID: o5508.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/17/05

GC Column: ID: (mm) Dilution Factor: 100

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
97-63-2	Ethyl methacrylate	<100	
74-88-4	Iodomethane	<500	

R
R

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: REC-1-EB

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-5

Sample wt/vol: 5 (g/mL) mL Lab File ID: p4695.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/14/05

GC Column: ID: (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	<1.0	
75-01-4	Vinyl chloride	<1.0	
75-09-2	Methylene Chloride	<1.0	
67-64-1	Acetone	<25	
75-15-0	Carbon disulfide	<1.0	
156-59-2	cis-1,2-Dichloroethene	<1.0	
156-60-5	trans-1,2-Dichloroethene	<1.0	
67-66-3	Chloroform	<1.0	
107-06-2	1,2-Dichloroethane	<1.0	
78-93-3	Methyl Ethyl Ketone	<10	
71-55-6	1,1,1-Trichloroethane	<1.0	
56-23-5	Carbon tetrachloride	<1.0	
75-27-4	Bromodichloromethane	<1.0	
79-01-6	Trichloroethene	1.0	
124-48-1	Chlorodibromomethane	<1.0	
71-43-2	Benzene	<1.0	
75-25-2	Bromoform	<1.0	
108-10-1	methyl isobutyl ketone	<10	
127-18-4	Tetrachloroethene	1.3	
108-88-3	Toluene	<1.0	
108-90-7	Chlorobenzene	<1.0	
100-41-4	Ethylbenzene	<1.0	
1330-20-7	Xylenes, Total	<2.0	

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: TB-1

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-6

Sample wt/vol: 5 (g/mL) mL Lab File ID: p4697.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/14/05

GC Column: ID: (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	<1.0	
75-01-4	Vinyl chloride	<1.0	
75-09-2	Methylene Chloride	<1.0	
67-64-1	Acetone	<25	
75-15-0	Carbon disulfide	<1.0	
156-59-2	cis-1,2-Dichloroethene	<1.0	
156-60-5	trans-1,2-Dichloroethene	<1.0	
67-66-3	Chloroform	<1.0	
107-06-2	1,2-Dichloroethane	<1.0	
78-93-3	Methyl Ethyl Ketone	<10	
71-55-6	1,1,1-Trichloroethane	<1.0	
56-23-5	Carbon tetrachloride	<1.0	
75-27-4	Bromodichloromethane	<1.0	
79-01-6	Trichloroethene	<1.0	
124-48-1	Chlorodibromomethane	<1.0	
71-43-2	Benzene	<1.0	
75-25-2	Bromoform	<1.0	
108-10-1	methyl isobutyl ketone	<10	
127-18-4	Tetrachloroethene	<1.0	
108-88-3	Toluene	<1.0	
108-90-7	Chlorobenzene	<1.0	
100-41-4	Ethylbenzene	<1.0	
1330-20-7	Xylenes, Total	<2.0	

Form 1
Volatile Organic Compounds by GC/MS

Client Sample ID: TB-1

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-6 RA

Sample wt/vol: 5 (g/mL) mL Lab File ID: o5500.d

Level: (low/med) Date Received: 03/03/05

% Moisture: not dec. Date Analyzed: 03/17/05

GC Column: ID: (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
97-63-2	Ethyl methacrylate	<1.0	
74-88-4	Iodomethane	<5.0	

Form 1
Dissolved Gases in Water

Client Sample ID: MW-3

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-1 PRIMARY

Sample wt/vol: _____ (g/mL) mL Lab File ID: U073.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 03/03/05

Extraction Method: _____ Date Extracted: _____

Concentrated Extract Volume: _____ (uL) Date Analyzed: 03/07/05

Injection Volume: _____ (uL) Dilution Factor: 1

GPC Cleanup: (Y/N) _____ pH: _____ Sulfur Cleanup: (Y/N) _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-84-0	Ethane	0.82	
74-85-1	Ethylene	<0.33	
74-82-8	Methane	40	

Form 1
Dissolved Gases in Water

Client Sample ID: REC-4

Lab Name: STL Savannah | Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water | Lab Sample ID: 680-1090-2 PRIMARY

Sample wt/vol: _____ (g/mL) mL | Lab File ID: U074.D

% Moisture: _____ Decanted: (Y/N) ___ | Date Received: 03/03/05

Extraction Method: _____ | Date Extracted: _____

Concentrated Extract Volume: _____ (uL) | Date Analyzed: 03/07/05

Injection Volume: _____ (uL) | Dilution Factor: 1

GPC Cleanup: (Y/N) _____ pH: _____ | Sulfur Cleanup: (Y/N) _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-84-0	Ethane	5.2	
74-85-1	Ethylene	4.4	
74-82-8	Methane	270	

Form 1
Dissolved Gases in Water

Client Sample ID: REC-4-DUP

Lab Name: STL Savannah | Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water | Lab Sample ID: 680-1090-3 PRIMARY

Sample wt/vol: _____ (g/mL) mL | Lab File ID: U075.D

% Moisture: _____ Decanted: (Y/N) ___ | Date Received: 03/03/05

Extraction Method: _____ | Date Extracted: _____

Concentrated Extract Volume: _____ (uL) | Date Analyzed: 03/07/05

Injection Volume: _____ (uL) | Dilution Factor: 1

GPC Cleanup: (Y/N) _____ pH: _____ | Sulfur Cleanup: (Y/N) _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-84-0	Ethane	4.0	
74-85-1	Ethylene	3.4	
74-82-8	Methane	210	

Form 1
Dissolved Gases in Water

Client Sample ID: REC-1

Lab Name: STL Savannah Job No.: 1090

SDG No.: QCM13

Matrix: (soil/water) Water Lab Sample ID: 680-1090-4 PRIMARY

Sample wt/vol: _____ (g/mL) mL Lab File ID: U076.D

% Moisture: _____ Decanted: (Y/N) ___ Date Received: 03/03/05

Extraction Method: _____ Date Extracted: _____

Concentrated Extract Volume: _____ (uL) Date Analyzed: 03/07/05

Injection Volume: _____ (uL) Dilution Factor: 1

GPC Cleanup: (Y/N) _____ pH: _____ Sulfur Cleanup: (Y/N) _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-84-0	Ethane	<0.35	
74-85-1	Ethylene	<0.33	
74-82-8	Methane	1.1	

General Chemistry

Client Sample ID: MW-3

Lab Sample ID: 680-1090-1
Client Matrix: Water

Date Sampled: 03/02/2005 0935
Date Received: 03/03/2005 0915

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Nitrogen, Nitrate	<0.050		mg/L	0.050	1.0	353.2	680-2532	03/03/2005 1641
Chloride	2500		mg/L	40	40	325.2	680-5022	03/24/2005 1110
Total Organic Carbon	*2.7*		*mg/L*	*1.0*	*1.0*	*415.1*	*680-4292*	*03/18/2005 1229*

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Alkalinity	200	J	mg/L	1.0	1.0	310.1	680-5547	03/28/2005 1455
Carbon dioxide	34		mg/L	1.0	1.0	310.1	680-5547	03/28/2005 1455
Sulfate	56		mg/L	10	2.0	375.4	680-5089	03/24/2005 1520

ɪnt Sample ID: REC-4

Lab Sample ID: 680-1090-2
Client Matrix: Water

Date Sampled: 03/02/2005 1150
Date Received: 03/03/2005 0915

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Nitrogen, Nitrate	<0.050		mg/L	0.050	1.0	353.2	680-2532	03/03/2005 1641
Chloride	680		mg/L	10	10	325.2	680-5022	03/24/2005 1110
Total Organic Carbon	*4.0*		*mg/L*	*1.0*	*1.0*	*415.1*	*680-4292*	*03/18/2005 1229*

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Alkalinity	430	J	mg/L	1.0	1.0	310.1	680-5547	03/28/2005 1455
Carbon dioxide	98		mg/L	1.0	1.0	310.1	680-5547	03/28/2005 1455
Sulfate	280		mg/L	50	10	375.4	680-5089	03/24/2005 1550

General Chemistry

Client Sample ID: REC-4-DUP

Lab Sample ID: 680-1090-3
Client Matrix: Water

Date Sampled: 03/02/2005 1150
Date Received: 03/03/2005 0915

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Nitrogen, Nitrate	<0.050		mg/L	0.050	1.0	353.2	680-2532	03/03/2005 1641
Chloride	680		mg/L	10	10	325.2	680-5022	03/24/2005 1110
Total Organic Carbon	*4.2*		*mg/L*	*1.0*	*1.0*	*415.1*	*680-5468*	*03/29/2005 1648*

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Alkalinity	430	J	mg/L	1.0	1.0	310.1	680-5547	03/28/2005 1455
Carbon dioxide	98		mg/L	1.0	1.0	310.1	680-5547	03/28/2005 1455
Sulfate	280		mg/L	50	10	375.4	680-5089	03/24/2005 1550

'ent Sample ID: REC-1

Lab Sample ID: 680-1090-4
Client Matrix: Water

Date Sampled: 03/02/2005 1425
Date Received: 03/03/2005 0915

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Nitrogen, Nitrate	0.62		mg/L	0.050	1.0	353.2	680-2532	03/03/2005 1641
Chloride	120		mg/L	2.0	2.0	325.2	680-5022	03/24/2005 1059
Total Organic Carbon	*3.1*		*mg/L*	*1.0*	*1.0*	*415.1*	*680-4292*	*03/18/2005 1229*

Analyte	Result	Qual	Units	RL	Dil	Method	Anly Batch	Date Analyzed
Alkalinity	230	J	mg/L	1.0	1.0	310.1	680-5547	03/28/2005 1455
Carbon dioxide	8.2		mg/L	1.0	1.0	310.1	680-5547	03/28/2005 1455
Sulfate	130		mg/L	25	5.0	375.4	680-5089	03/24/2005 1550

LOW FLOW GROUN_..ATER SAMPLING DATA SHEET

PROJECT NAME: SOLUTIA QUEENY PROJECT NUMBER: 21561401.00002 FIELD PERSONNEL: JLP + MEC
DATE: 3-2-05 WEATHER: mid 30's clear
MONITORING WELL ID: MW-3

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): 31.22 ft
Depth to Water (btoc): 12.27 ft
Depth to LNAPL/DNAPL (btoc): ft
Depth to Top of Screen (btoc): 22.65 ft
Screen Length: 10 ft

Water Column Height (do not include LNAPL or DNAPL): ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = ft btoc

Volume of Flow Through Cell): 250 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 750 mL
Ambient PID/FID Reading: 0.1 ppm
Wellbore PID/FID Reading: 0.3 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	Turbidity	pH	Temp (°C)	Cond. (µS/cm)	DO (mg/l)	ORP (mV)
250	9:14	16.27	Brown	No	cloudy	6.79	14.97	5446	3.39	125
500	9:17	16.35				6.73	15.31	5516	2.87	124
750	9:19	16.24				6.70	15.66	5707	2.47	119
1000	9:20	16.21				6.70	16.00	5803	2.27	115
1250	9:21	16.20				6.70	15.97	5810	2.11	112
1500	9:23	16.20				6.72	15.63	5810	1.91	109
1750	9:24	16.20				6.72	15.70	5820	1.81	108
2000	9:25	16.19				6.73	15.87	5936	1.73	106
2250	9:26	16.19				6.73	16.53	6093	1.66	104
2500	9:27	16.19				6.73	16.53	6148	1.53	103
2750	9:28	16.19				6.73	16.50	6221	1.51	103
3000	9:29	16.19				6.72	16.50	6328	1.46	102

Start Time: 9:14
Stop Time: 9:29
Elapsed Time: 15 min
Average Purge Rate (mL/min): 250 mL/min
Water Quality Meter ID: Troll 9000
Date Calibrated: 3-2-05

SAMPLING DATA

Sample Date: 3-2-05
Sample Method: Stainless Steel Monsoon
Sample Time: 9:35
Sample Flow Rate: 250 mL/min
Analysis: VOCs, Dissolved Gases (Ethane, Ethene, Methane), Nitrate, Sulfate, Alkalinity, Chloride, CO_2, TOC

COMMENTS:

Ferrous Iron reading overrange
Depths at end of event DTW = 12.45 DTB = 30.27
Two events at the beginning of purging caused water spray onto the ground in both events water was soaked up with paper towels.

URS CORPORATION
GROUNDWATER SAMPLE COLLECTION FIELD SHEET

Site Name: Solutia Queeny

Project No: 21561398.00001

Sample ID: MW-3

Well Location: FF

/Time Collected: 3-2-05

Depth to water (from top of casing): 12.27

Sampling Method: Low Flow

Equipment Blank (Circle one)	Yes	(No)	Equipment Blank ID:
Duplicate Sample (Circle one)	Yes	(No)	Duplicate ID:
Matrix Spike (Circle one)	Yes	(No)	MS ID:
Matrix Spike Duplicate (Circle one)	Yes	(No)	MSD ID:

Sample Collected	Sample Container	Preservative	Analysis Required
yes	(4) 40ml VOA	HCL	VOCs (Method 8260)
yes	(1) 1 L nalgene	None	Alkalinity, Cl, SO_4, NO_3, CO_2 (Methods 310.1, 325.2, 325.4, 353.2, 310.1)
yes	(1) 125 ml nalgene	H_2SO_4	NO_3 (Method 353.2)
yes	(4) 40ml VOA	None	Dissolved Gases [Methane/Ethane/Ethene (Method RSK-175)]
yes	(1) 125 ml amber glass	HCL	TOC (Method 415.1)

Headspace Screening (Circle one) (Yes) No Reading: 0.3 ppm

PID type: Mini Rae 2000

Comments:

Samplers: J. Prien + M Corbett

Signatures:

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: SOLUTIA QUEENY PROJECT NUMBER: 21561401.00002 FIELD PERSONNEL: JLP MEC
DATE: 3-2-05 WEATHER: sunny 45°
MONITORING WELL ID: REC-4

INITIAL DATA

Well Diameter: 4 in
Total Well Depth (btoc): 62.24 ft
Depth to Water (btoc): 12.16 ft
Depth to LNAPL/DNAPL (btoc): ft
Depth to Top of Screen (btoc): ft
Screen Length: 20 ft

Water Column Height (do not include LNAPL or DNAPL): ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is ⟨4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are ⟨ 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = ft btoc

Volume of Flow Through Cell): 250 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 750 mL
Ambient PID/FID Reading: 0.3 ppm
Wellbore PID/FID Reading: 0.5 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	Turbidity	pH	Temp (°C)	Cond. (µS/cm)	DO (mg/l)	ORP (mV)
250	10:28	12.18				7.73	15.04	1275	4.10	111
500	10:30	12.19				6.64	16.86	2351	2.09	51
750	11:32	12.19				6.53	17.11	2625	1.02	39
1000	11:34	12.20				6.45	17.25	2720	0.66	34
1250	11:36	12.19	Brown	NO	slight	6.44	17.00	2757	0.51	30
1500	11:35	12.19				6.45	17.14	2784	0.45	27
1750	11:39	12.18				6.46	16.92	2762	0.42	24
2000	11:41	12.18				6.48	16.49	2766	0.42	21
2250	11:43	12.18	slight brown	No	Slight	6.49	16.33	2751	0.43	19
2500	11:45	13.18				6.50	16.52	2772	0.43	18
2750	11:47	12.18				6.50	16.41	2759	0.43	17

Start Time: 10:26
Stop Time: 11:47
Elapsed Time: 21 min
Average Purge Rate (mL/min): 125 mL/min
Water Quality Meter ID: Troll 9000
Date Calibrated: 3-2-05

SAMPLING DATA

Sample Date: 3-2-05
Sample Method: Stainless Steel Monsoon
Sample Time: 11:50
Sample Flow Rate: 123 mL/min
Analysis: VOCs, Dissolved Gases (Ethane, Ethene, Methane), Nitrate, Sulfate, Alkalinity, Chloride, CO_2, TOC

COMMENTS:

Ferrious Iron 1.90 mg/L 1.97 mg/L
Final Depth 13.15 ft
REC-4-Dup taken at 11:50

URS CORPORATION
GROUNDWATER SAMPLE COLLECTION FIELD SHEET

Site Name: Solutia Queeny

Project No: 21561398.00001

Sample ID: REC-4

Well Location: EF

/Time Collected: 3-2-05

Depth to water (from top of casing): 12.16

Sampling Method: Low Flow

Equipment Blank (Circle one)	Yes	(No)	Equipment Blank ID:
Duplicate Sample (Circle one)	(Yes)	No	Duplicate ID: REC-4-Dup
Matrix Spike (Circle one)	Yes	(No)	MS ID:
Matrix Spike Duplicate (Circle one)	Yes	(No)	MSD ID:

Sample Collected	Sample Container	Preservative	Analysis Required
yes	(4) 40ml VOA	HCL	VOCs (Method 8260)
yes	(1) 1 L nalgene	None	Alkalinity, Cl, SO_4, NO_3, CO_2 (Methods 310.1, 325.2, 325.4, 353.2, 310.1)
yes	(1) 125 ml nalgene	H_2SO_4	NO_3 (Method 353.2)
yes	(4) 40ml VOA	None	Dissolved Gases [Methane/Ethane/Ethene (Method RSK-175)]
yes	(1) 125 ml amber glass	HCL	TOC (Method 415.1)

Headspace Screening (Circle one) (Yes) No Reading: 0.5

PID type: Mini Rae 2000

Comments:

Samplers: J. Prien M Corbett

Signatures:

LOW FLOW GROU..WATER SAMPLING DATA SHEET

PROJECT NAME: SOLUTIA QUEENY PROJECT NUMBER: 21561401.00002 FIELD PERSONNEL: JLP + MEC
DATE: 3-2-05 WEATHER: Sunny 40's
MONITORING WELL ID: REC-1

INITIAL DATA

Well Diameter: 4 in
Total Well Depth (btoc): 47.35 ft
Depth to Water (btoc): 11.35 ft
Depth to LNAPL/DNAPL (btoc): ft
Depth to Top of Screen (btoc): ft
Screen Length: 30 ft

Water Column Height (do not include LNAPL or DNAPL): ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = ft btoc

Volume of Flow Through Cell): 250 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 750 mL
Ambient PID/FID Reading: 1.3 ppm
Wellbore PID/FID Reading: 5.1 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	Turbidity	pH	Temp (°C)	Cond. (µS/cm)	DO (mg/l)	ORP (mV)
250	1400	11.38	clear	NO	clear	7.6	15.23	883.7	5.38	98
500	14:02	11.44	clear		cloudy	7.51	15.30	883.7	4.83	106
750	14:03	11.48				7.46	15.61	890.4	4.35	109
1000	14:05	11.50				7.42	15.63	890.2	4.00	112
1250	14:08	11.52				7.31	15.34	884.3	3.92	119
1500	14:09	11.57				7.29	15.50	886.8	3.88	120
1750	14:10	11.59				7.30	15.23	882.3	3.89	120
2000	14:12	11.61				7.31	14.84	873.1	3.75	120
2250	14:15	11.64				7.31	15.24	882.0	3.67	130
2500	14:17	11.67				7.31	14.89	875.9	3.70	180
2750	14:19	11.69				7.32	15.12	880.2	3.60	120
3000	14:21	11.72				7.32	15.30	884.6	3.59	120
3250	14:22	11.75				7.32	15.26	881.9	3.60	120

Start Time: 13:56
Stop Time: 14:22
Elapsed Time: 26 min
Average Purge Rate (mL/min): 125
Water Quality Meter ID: Troll 9000
Date Calibrated: 3-2-05

SAMPLING DATA

Sample Date: ~~14:25~~ 3-2-05
Sample Method: Stainless Steel Monsoon
Sample Time: 14:25
Sample Flow Rate: 125 mL/min
Analysis: VOCs, Dissolved Gases (Ethane, Ethene, Methane), Nitrate, Sulfate, Alkalinity, Chloride, CO_2, TOC

COMMENTS:

REC-1-EB sampled at 13:45
Ferrous iron 0.3 mg/L

URS CORPORATION
GROUNDWATER SAMPLE COLLECTION FIELD SHEET

Site Name: Solutia Queeny

Project No: 21561398.00001

Sample ID: REC-1

Well Location: FF

Date/Time Collected: 3-2-05 14:25

Depth to water (from top of casing): 11.35

Sampling Method: Low Flow

Equipment Blank (Circle one)	(Yes)	No	Equipment Blank ID: REC-1-EB
Duplicate Sample (Circle one)	Yes	(No)	Duplicate ID:
Matrix Spike (Circle one)	Yes	(No)	MS ID:
Matrix Spike Duplicate (Circle one)	Yes	(No)	MSD ID:

Sample Collected	Sample Container	Preservative	Analysis Required
yes	(4) 40ml VOA	HCL	VOCs (Method 8260)
yes	(1) 1 L nalgene	None	Alkalinity, Cl, SO_4, NO_3, CO_2 (Methods 310.1, 325.2, 325.4, 353.2, 310.1)
yes	(1) 125 ml nalgene	H_2SO_4	NO_3 (Method 353.2)
yes	(4) 40ml VOA	None	Dissolved Gases [Methane/Ethane/Ethene (Method RSK-175)]
yes	(1) 125 ml amber glass	HCL	TOC (Method 415.1)

Headspace Screening (Circle one) (Yes) No Reading: 5.1

PID type: Mini Rae 2000

Comments:

Samplers: J. Prien M Corbett

Signatures:

URS

LOW FLOW GROU..ATER SAMPLING DATA SHEET

PROJECT NAME: SOLUTIA QUEENY PROJECT NUMBER: 21561401.00002 FIELD PERSONNEL: T. Prien + M. Corbett
DATE: 3-3-05 WEATHER: Sunny 30's
MONITORING WELL ID: LP2-5

INITIAL DATA

Well Diameter: ____ in
Total Well Depth (btoc): 31.85 ft
Depth to Water (btoc): 9.47 ft
Depth to LNAPL/DNAPL (btoc): 9.47 ft
Depth to Top of Screen (btoc): ____ ft
Screen Length: ____ ft

Water Column Height (do not include LNAPL or DNAPL): ____ ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = ____ ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = ____ ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = ____ ft btoc

Volume of Flow Through Cell): 250 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 750 mL
Ambient PID/FID Reading: 3.5 ppm
Wellbore PID/FID Reading: 25.1 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	Turbidity	pH	Temp (°C)	Cond. (µS/cm)	DO (mg/l)	ORP (mV)
250	8:04	9.69	black	No	slight	7.25	12.41	2230	2.31	-144
500	8:05	9.71				7.24	13.34	2278	1.37	-158
750	8:07	9.73				7.26	13.72	2293	1.11	-166
1000	8:08	9.75				7.29	13.85	2297	0.99	-170
1250	8:09	9.77				7.32	13.64	2286	0.93	-174
1500	8:10	9.77				7.33	13.60	2280	0.86	-176
1750	8:12	9.82				7.33	13.42	2283	0.84	-177
2000	8:13	9.83				7.32	14.05	2320	0.78	-178
2250	8:14	9.88				7.32	14.21	2345	0.78	-178
2500	8:15	9.91				7.32	14.44	2355	0.78	-178
2750	8:16	9.91				7.32	14.54	2364	0.74	-179
3000	8:17	9.83				7.33	14.54	2372	0.75	-178
3250	8:18	9.93				7.32	14.60	2371	0.73	-178

Start Time: 8:04
Stop Time: 8:18
Elapsed Time: 14 min
Average Purge Rate (mL/min): 250
Water Quality Meter ID: Troll 9000
Date Calibrated: 3-3-05

SAMPLING DATA

Sample Date: 3-3-05
Sample Method: Stainless Steel Monsoon
Sample Time: 8:20
Sample Flow Rate: 250 mL/min
Analysis: VOCs, Dissolved Gases (Ethane, Ethene, Methane), Nitrate, Sulfate, Alkalinity, Chloride, CO_2, TOC

COMMENTS:

Ferrous Iron 0.25 mg/L

URS CORPORATION
GROUNDWATER SAMPLE COLLECTION FIELD SHEET

Site Name: Solutia Queeny

Project No: 21561398.00001

Sample ID: LP2-5

Well Location: FF

e/Time Collected: 3-3-05 / 8:20

Depth to water (from top of casing): 9.47

Sampling Method: Low Flow

Equipment Blank (Circle one)	Yes	(No)	Equipment Blank ID:
Duplicate Sample (Circle one)	Yes	(No)	Duplicate ID:
Matrix Spike (Circle one)	Yes	(No)	MS ID:
Matrix Spike Duplicate (Circle one)	Yes	(No)	MSD ID:

Sample Collected	Sample Container	Preservative	Analysis Required
yes	(4) 40ml VOA	HCL	VOCs (Method 8260)
yes	(1) 1 L nalgene	None	Alkalinity, Cl, SO_4, NO_3, CO_2 (Methods 310.1, 325.2, 325.4, 353.2, 310.1)
yes	(1) 125 ml nalgene	H_2SO_4	NO_3 (Method 353.2)
yes	(4) 40ml VOA	None	Dissolved Gases [Methane/Ethane/Ethene (Method RSK-175)]
yes	(1) 125 ml amber glass	HCL	TOC (Method 415.1)

Headspace Screening (Circle one) (Yes) No Reading: 251 ppm

PID type: Mini Rae 2000

Comments:

Samplers: J. Prien + M Corbett

Signatures:

LOW FLOW GROUNDWATER SAMPLING DATA SHEET

PROJECT NAME: SOLUTIA QUEENY PROJECT NUMBER: 21561401.00002 FIELD PERSONNEL: J. Prien + M. Corbett
DATE: 3-3-05 WEATHER: Sunny 40's
MONITORING WELL ID: LPZ-2

INITIAL DATA

Well Diameter: 2 in
Total Well Depth (btoc): 22.10 ft
Depth to Water (btoc): 9.09 ft
Depth to LNAPL/DNAPL (btoc): 9.09 ft
Depth to Top of Screen (btoc): ft
Screen Length: ft

Water Column Height (do not include LNAPL or DNAPL): ft btoc
If Depth to Top of Screen is > Depth to Water AND Screen Lenth is <4 feet,
Place Pump at: Total Well Depth – 0.5 (Screen Length + DNAPL Column Height) = ft btoc
If Depth to Top of Screen is < Depth to Water AND Water Column Height and Screen Length are < 4ft,
Place Pump at: Total Well Depth – (0.5 X Water Column Height + DNAPL Column Height) = ft btoc
If Screen Length and/or water column height is < 4 ft, Place Pump at: Total Well Depth - 2 ft = ft btoc

Volume of Flow Through Cell): 250 mL
Minimum Purge Volume =
(3 x Flow Through Cell Volume) 750 mL
Ambient PID/FID Reading: 0.1 ppm
Wellbore PID/FID Reading: 3.3 ppm

PURGE DATA

Pump Type: Stainless Steel Monsoon

Purge Volume (mL)	Time	Depth to Water (ft)	Color	Odor	Turbidity	pH	Temp (°C)	Cond. (µS/cm)	DO (mg/l)	ORP (mV)
250	10:13	9.34	light grey	yes	slight	6.95	13.87	1429	1.07	-112
500	10:14	9.41				6.91	14.01	1429	0.70	-122
750	10:16	9.47				6.89	13.87	1420	0.52	-128
1000	10:18	9.54				6.84	13.65	1417	0.43	-133
1250	10:20	9.59				6.89	13.61	1414	0.39	-136
1500	10:22	9.67	slightly grey			6.89	13.39	1404	0.37	-140
1750	10:25	9.73				6.87	13.30	1403	0.34	-141
2000	10:27	9.76				6.90	13.08	1398	0.33	-142
2250	10:30	9.87				6.90	13.52	1434	0.31	-140
2500	10:32	9.96				6.89	14.43	1441	0.25	-146
2750	10:34	9.98				6.90	13.99	1437	0.23	-146
3000	10:38	10.02				6.93	12.55	1376	0.26	-139
3250	10:40	10.16				6.71	14.46	1457	0.22	-143
3300	10:41	10.21				6.90	15.08	1475	0.20	-146
3750	10:42	10.25				6.89	15.13	1475	0.20	-147
4000	10:43	10.32	clear			6.90	15.11	1477	0.19	-148

Start Time: 10:11
Stop Time: 10:43
Elapsed Time: 32
Average Purge Rate (mL/min): 125
Water Quality Meter ID: Troll 9000
Date Calibrated: 3-3-05

SAMPLING DATA

Sample Date: 3-3-05
Sample Method: Stainless Steel Monsoon
Sample Time: 10:45
Sample Flow Rate: 125 mL/min
Analysis: VOCs, Dissolved Gases (Ethane, Ethene, Methane), Nitrate, Sulfate, Alkalinity, Chloride, CO_2, TOC

COMMENTS:
Ferrious 0.47, 0.47, 0.48
LPZ-2-MS + LPZ-2-MSD collected

URS CORPORATION
GROUNDWATER SAMPLE COLLECTION FIELD SHEET

Site Name: Solutia Queeny

Project No: 21561398.00001

Sample ID: LP2-2

Well Location: FF

e/Time Collected: 10:45 3-3-05

Depth to water (from top of casing): 9.09

Sampling Method: Low Flow

Equipment Blank (Circle one)	Yes	(No)	Equipment Blank ID:
Duplicate Sample (Circle one)	Yes	(No)	Duplicate ID:
Matrix Spike (Circle one)	(Yes)	No	MS ID: LP2-2-MS
Matrix Spike Duplicate (Circle one)	(Yes)	No	MSD ID: LP2-2-MSD

Sample Collected	Sample Container	Preservative	Analysis Required
yes	(4) 40ml VOA	HCL	VOCs (Method 8260)
yes	(1) 1 L nalgene	None	Alkalinity, Cl, SO_4, NO_3, CO_2 (Methods 310.1, 325.2, 325.4, 353.2, 310.1)
yes	(1) 125 ml nalgene	H_2SO_4	NO_3 (Method 353.2)
yes	(4) 40ml VOA	None	Dissolved Gases [Methane/Ethane/Ethene (Method RSK-175)]
yes	(1) 125 ml amber glass	HCL	TOC (Method 415.1)

Headspace Screening (Circle one) (Yes) No Reading: 3.3

PID type: Mini Rae 2000

Comments:

Samplers: J. Prien + M. Corbett

Signatures:

URS

Serial Number 034407

SEVERN TRENT SERVICES

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

STL Savannah

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

Website: www.stl-inc.com
Phone: (912) 354-7858
Fax: (912) 352-0165

Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE: Solutia Queeny FF	PROJECT NO.: 21561401.00002	PROJECT LOCATION (STATE): MO	
STL (LAB) PROJECT MANAGER: Lydia Guilizia	P.O. NUMBER:	CONTRACT NO.	
CLIENT (SITE) PM: Jeff Adams	CLIENT PHONE: 314-429-0100	CLIENT FAX: 314-429-0462	
CLIENT NAME: VRS Corp.	CLIENT E-MAIL		
CLIENT ADDRESS: 1001 Highlands Plaza Dr. W. Ste 300 St. Louis, MO 63110			
COMPANY CONTRACTING THIS WORK (if applicable)			

PAGE 1 OF 1

STANDARD REPORT DELIVERY ( )
DATE DUE

EXPEDITED REPORT DELIVERY (SURCHARGE) ( )
DATE DUE

NUMBER OF COOLERS SUBMITTED PER SHIPMENT: 1

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	REQUIRED ANALYSIS: VOC's	Diss. Gases Ethane, Ethene, Methane	Nitrate	Nitrate, air, CO_2 Soy Chloride	TOC	NUMBER OF CONTAINERS SUBMITTED	REMARKS
								HCL	None	H_2SO_4	None	HCL	PRESERVATIVE	
3-3-05	0820	LPZ-5		X				X	X	X	X	X		
3-3-05	1015	LPZ-2		X				X	X	X	X	X		
3-3-05	1015	LPZ-2-MS		X				X	X	X	X	X		
3-3-05	1015	LPZ-2-MSD		X				X	X	X	X	X		
3-3-05	1600	TB-1		X				X						

TEMP. 5.6

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Mike Collett	3/3/05	1300						
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS
	3/4/05	900	YES ( ) NO ( )		5030123	100-125

ORIGINAL – RETURN TO LAB[illegible]RY WITH SAMPLE(S)

APPENDIX G

ANNUAL GROUNDWATER MONITORING REPORT REVIEW WORKSHEET

200X ANNUAL GROUNDWATER REPORT REVIEW
Prepared by
MISSOURI DEPARTMENT OF NATURAL RESOURCES
HAZARDOUS WASTE PROGRAM
GROUNDWATER UNIT

FACILITY: _____

DOCUMENT NAME: _____

DOCUMENT DATE SENT: _____

DATE REVIEWED: _____

REVIEWER: _____

REGULATORY STATUS OF FACILITY: _____

1.0 GROUNDWATER MONITORING SYSTEM DESCRIPTION

1.1 Does the document contain a description of the conceptual model of groundwater flow and contaminant transport from known releases? Does the document explain how the site groundwater monitoring system has been constructed? Is there an assessment of fit with the conceptual model? The phrase 'conceptual model' is not required, but the information supporting these issues must be included.

_____

_____

_____

_____

_____

_____

1.2 Does the document conclude that the monitoring system is adequate for the intended use? A detection monitoring system must be capable of quickly and surely detecting a release. A system monitoring a contaminant plume must be capable of: defining contaminant extent in three dimensions;

guarding against undetected transport beyond the monitoring system; and, in some cases guard against undetected transport to human or ecological receptors. All monitoring systems must provide representative samples and hydraulic information. Does the document provide evidence to demonstrate that the monitoring system is achieving the applicable goals?

_____

_____

_____

_____

_____

2.0 ARE THE FOLLOWING ITEMS CONTAINED IN THE DOCUMENT? Y/N

2.1 Well location map showing all existing monitoring wells? ____

2.2 Measured total depths for all active monitoring wells? ____

2.3 List of analytical methods and/or monitored parameters? ____

2.4 A schedule for sampling frequency? ____

2.5 Is the frequency based on parameter, analytical method, or well grouping?

_____

_____

_____

2.6 Reviewed and certified by a registered geologist or engineer? Please check Missouri State web sites for listing of registrants. ____

2.7 Date of the current, approved sampling and analysis plan (SAP)? ____

3.0 ARE THE FOLLOWING ITEMS CONTAINED IN THE DOCUMENT FOR EACH SAMPLING EVENT?

3.1 Static groundwater elevation data? ____

3.2 Groundwater elevation contour maps? ____

3.3 How many maps and what variables (i.e. event, horizon, well grouping)?

_____

3.4 Analytical results for each groundwater parameter and method? ____

3.5 Copies of the laboratory reports? Copies are preferred over a summary of the data. ____

3.6 Statistical evaluation of groundwater monitoring results as per detection monitoring regulations, approved assessment monitoring plan, or, in the case of permitted facilities, the compliance monitoring plan? ____

3.7 A comparison between analytical results and regulatory standards? (i.e. drinking water MCL's, permit-based limits or screening criteria) ____

4.0 DESCRIPTION OF HYDRAULIC ZONES

4.1 How many hydraulically distinct "zones" does the facility recognize? ____

4.2 Do the groundwater elevation contour maps provide an adequate demonstration of the groundwater flow direction(s) in each of the hydraulic zones? (number of wells and arrangement) ____

4.3 Do these zones fit the conceptual model of groundwater flow and contaminant transport? ____

5.0 GROUNDWATER FLOW PARAMETERS

5.1 Describe the evaluation of horizontal gradients, horizontal flow direction(s), and rate(s) of horizontal groundwater flow. What information is used to support these estimations? Is the data adequate to support the conclusions?

_____

_____

_____

_____

5.2 Critique the same issues and answer the same questions for vertical gradients, vertical flow directions, and rate(s) of vertical groundwater flow.

6.0 WELLBORE SILTATION

6.1 Does the document provide a comparison of measured well depth and as-built well depth for each active well? ____

6.2 Is there a description of the maintenance standard for siltation? ____

6.3 If there is a problem due to siltation, does the annual report propose maintenance for the near future? ____

7.0 MONITORING SYSTEM MAINTENANCE

7.1 List the monitoring well maintenance activities that were conducted during the year and note any problem issues.

7.2 List any new well installations, exploratory drilling, or characterization activities that occurred during the subject year. Does the document conclude whether any new data conflicts with previous characterization studies or the conceptual model? Are there any apparent problems?

8.0 ASSESSMENT/COMPLIANCE STATUS (APPROPRIATE FACILITIES)

8.1 How many hazardous waste constituents have been identified in the groundwater? _____

8.2 List each identified constituent and group into those exceeding standards and those meeting standards for analyte detections (as described in question 3.7).

8.3 Has the horizontal extent of contamination been determined? Do the active wells provide adequate coverage? Are clean wells or low-concentration wells located at the system edge that will document any further plume movement? Are there inactive monitoring wells that should be returned to active sampling?

8.4 Has the vertical extent of contamination been determined? Address the same issues as the prior question.

8.5 Has the rate of contaminant migration been presented? How was it determined? Is it sufficient to estimate the rate of contaminant transport?

_____

_____

_____

9.0 SURFACE WATER MONITORING

9.1 Is there a post-closure permit or operating landfill permit requiring surface water monitoring? _____

9.2 Does the document include surface water monitoring data? _____

9.3 Describe any sampling results that demonstrate levels exceeding post-closure permit standards. If applicable, does the document propose any remedies for exceeding surface water quality standards?

_____

_____

_____

10.0 QUALITY ASSURANCE AND QUALITY CONTROL, QA/QC

10.1 Does the document provide a listing of items and standards for adequate QA/QC controls and requirements regarding groundwater (and surface water, if applicable) analyses?

_____

_____

_____

10.2 Does the document provide complete data validation? Data validation should include, at a minimum: a review of holding times; sample preservation; GC/MS instrument performance check; initial calibration; continuing calibration; blanks (field, equipment, etc.); surrogate spikes; matrix spikes; matrix spike duplicates; laboratory control samples; regional quality assurance and quality control; internal standards; target compound identification; and compound quantitation. Reported contract required quantitation limits, tentatively identified compounds, system performance, and an overall assessment of data should also be provided. Reviews should

be completed to find COC form inconsistencies; to compare the target analyte list to the constituents of concern and identify missing analytes for each sample; and, to determine compliance with the method detection limits/practical quantitation limits (PQLs). The overall assessment of data should include a discussion of instances where quality control parameters are exceeded and should identify any data outliers. The document should conclude whether the data are reliable based upon the data validation review.

10.3 For samples where preservation includes a temperature requirement, do the laboratory reports document the sample temperature as received by the laboratory? Are the actual recorded temperatures appropriate? ____

10.4 Are duplicate samples labeled with a false well name so that the duplicate nature of the sample is not revealed to the laboratory? ____

11.0 LONG-TERM STEWARDSHIP

11.1 For monitoring systems in long-term care, list the engineering controls, institutional controls and other long-term stewardship activities. Does the document discuss status and changes regarding these elements of long-term care? Any apparent problems?

12.0 COMMENTS

12.1 Describe any other issues identified, problems, or unusual information.